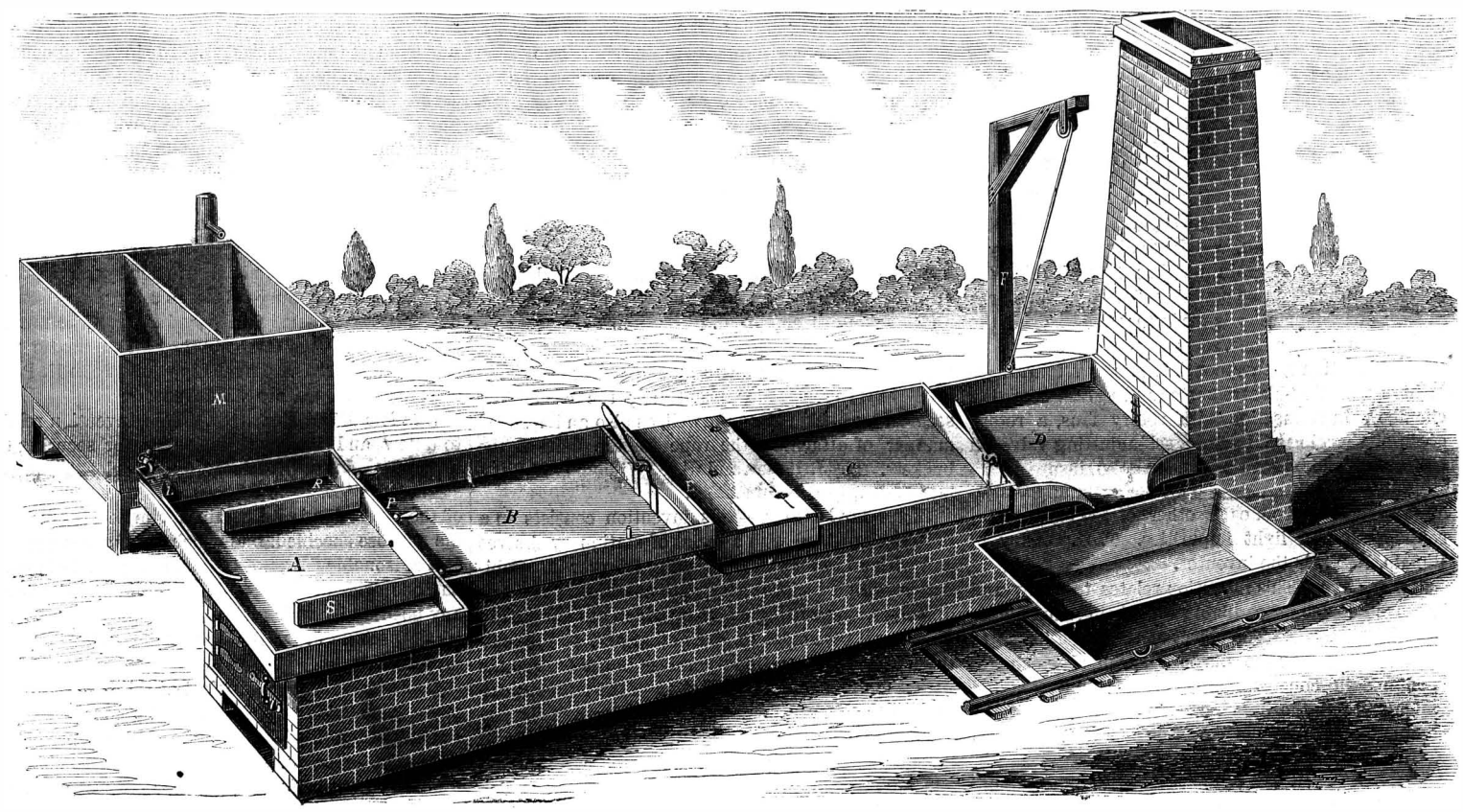
Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

Vol. XI.---No. 12. (NEW SERIES.) NEW YORK, SEPTEMBER 17, 1864. $3 PER ANNUM (IN ADVANCE.)

Improved Sorghum Evaporator.

The inventor of the sugar evaporator published herewith claims that he has succeeded in producing an apparatus which accomplishes the manufacture of sugar from the sorghum cane in the most perfect manner. By it all impurities are quickly and effectually removed, with but little labor, and the harsh vegetable taste, peculiar to the sorghum sugar, entirely removed. The finishing-pan is so constructed as to allow the syrup to be perfectly evaporated without burning the sugar, and facilities are afforded for its subsequent removal from the fire, by dumping it into a cooler. This evaporator is also economical in fuel and labor. Appended is the inventor's description of the apparatus and its operation:—



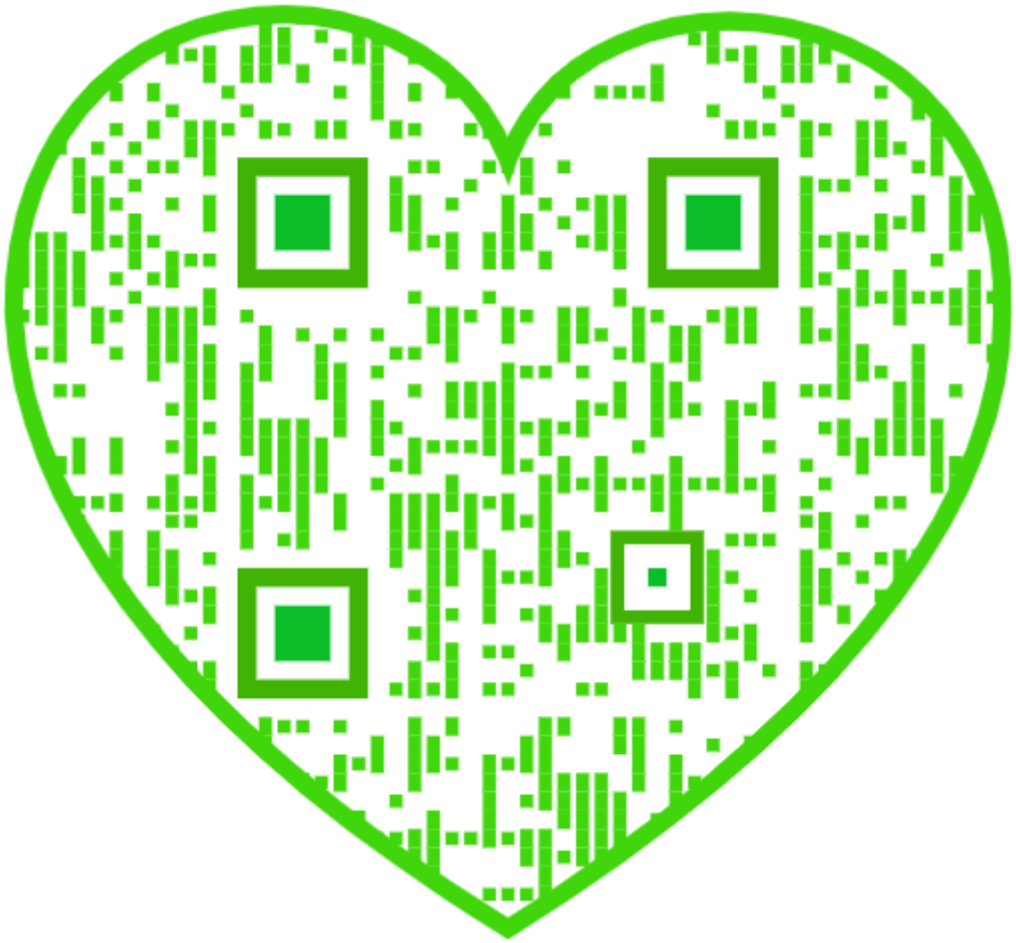
STEWART'S SORGHUM EVAPORATOR.

The plan and mode of this apparatus is represented in the engraving. It consists of four sections or divisions, A, B, C, D. The first three are stationary, while the fourth, D, is movable upon a horizontal axis. The divisions are made of sheet copper or iron, and when of the last-mentioned material have wooden sides. They are shallow and flat, and placed in a descending range, the pan, A, being the highest in the series. From the rear of the pan, A, two abutments or ledges S S, extend along its bottom for about two-thirds of its length, toward the front. The pan, A, projects over the sides and front of the furnace wall, and the abutments are so placed as to stand directly over the inner face of the side walls, and terminate just over the end wall of the furnace. That portion of this pan, therefore, which is situated between the abutments is exposed to the full heat of the fire, while the remainder is comparatively cool. This arrangement effects a complete separation of the scum, in the following manner:—The cane juice is received from the mill through a pipe into the tank, M, where it is prepared for clarification by first neutralizing it and then treating it with a small quantity of new defecating substance. From a compartment of the tank, M, the juice is then admitted to the head of the pan, A, through the conduit, L, in a continuous stream—the quantity received from the tank being always duly regulated by the rapidity with which it is heated, defecated, and finally discharged through the adjustable gate, G, into the next division or pan, B. The bed of juice in the pan, A, should be kept at a uniform depth of about one inch, and it will be kept in constant and rapid ebullition over all the central space between the abutments. The surface of the boiling liquid through this space is consequently much elevated, while toward the front of the pan, and within the bays or recesses, R R, at the sides, it is not heated. A surface current is created, which carries the scum forward and down into the receptacles, R R, where it lodges, and as it cools it becomes densely compacted and displaces any unclarified juice that may have collected at the commencement of the operation. The gates, P P, the openings of which are protected by wire gauze, afford a convenient exit into B, at the close of the day's boiling, for any clarified juice which may subsequently have been thrown into the bays when they were not packed with scum. Ordinarily the gates, P P, should be kept shut. At convenient intervals of time (once every half hour or hour, according to the size of the pan,) the dense mass of scum in the bays is lifted out by means of a large square flat dipper or shovel, with a perforated bottom, of such width as to slide closely inside the bays. At the same time that the scum is being separated and carried forward an undercurrent of cold juice is continually passing forward, and rapidly becoming heated. At a certain point as it advances it is thrown into ebullition, where it parts company with the scum, and impelled onward by the colder current behind it, escapes by the gate, G, into the next division, B. In B the juice is evaporated to a density of about 20° Beaume, by a thermometer kept immersed in the boiling juice at the back part of this division. A sliding gate or register, easily adjusted, both regulates the concentration to the required degree in this compartment and the discharge of the sirup from it into E, a shallow cistern, containing animal charcoal prepared expressly for this purpose. Through this filter the hot sirup passes into C, the third compartment of the series. The effect of this filtration is the removal of all the impurities which hinder crystallization, and of the peculiar flavor of unrefined sorghum sirup. A sirup so prepared is strictly a *refined sirup* of the first quality At this stage the sirup is clear, and unsurpassed in color and flavor. To preserve these qualities unimpaired to the close of the operation the subsequent evaporation must be rapid, and the sirup must instantly be removed from the fire when the proper degree of concentration is reached. The pan, C, in connection with the finishing pan, D, fully accomplishes these ends. After being reduced by boiling in C the sirup is passed through a gate, at intervals, into D. This pan is shallow, with a long beak or lip, and may be easily turned upon its axis by means of a lever, or cord and pulley, as at F, and successive batches of sirup upon arriving at the proper point of density, are dumped into a large shallow tank or cooler at the side of the range.

When the pan, D, is tipped to discharge the concentrated sirup a damper is drawn which shuts off the flame until the pan is replaced and a fesh portion of sirup admitted. Parties interested in the manufacture of sorghum sugar will do well to examine into the merits of this evaporation.

This invention was patented through the Scientific American Patent Agency on January 5th, 1864. For further information address the patentee, F. L. Stewart, Murraysville; Westmoreland County, Pa.

© 1864 SCIENTIFIC AMERICAN, INC.



RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week ; the claims may be found in the official list:—

Siphon for Separating Gold from Crushed Quartz.—This invention relates to a new and improved siphon for separating gold from crushed quartz, and is designed to be applied chiefly to the annular trough of what is generally known as the "Chilian mill." The object of the invention is to draw off the water at its surface in the trough where the quartz is undergoing the process of crushing, which portion of the water contains the finely pulverized quartz and fine gold in suspension, and in drawing off said water to separate, by amalgamation, the gold from the foreign substances. A. W. Hall, of New York City, is the inventor.

Stove Damper.—This invention relates to a new and improved damper for stovepipes, by which the damper, when fully closed, will admit of sufficient draught to cause the gases to be carried up the pipe, thereby preventing the escape of the gases into the compartment in which the stove is placed, the slight draught allowing but an extremely slow combustion of the fuel in the stove. The damper when opened admits of a good draught, sufficiently so to cause a proper combustion of the fuel without allowing the heat to escape up through the pipe into the flue. John A. Noble, of Florence, Mass., is the inventor.

Grain Separator.—This invention consists in the employment or use of a wheel, arranged in such relation with a hopper or grain spout that the grain as it enters the separator will fall upon the wheel and rotate it, the latter giving motion to a governor, which is connected with a valve that controls the blast; all being arranged in such a manner that the strength of the blast, which separates the light impurities from the grain, will be made commensurate with the amount of grain passing through the machine, and the grain be perfectly cleansed, whether a greater or less quantity is made to pass through the machine in a given time.

The invention further consists in a novel arrangement of a suction-blast chamber and a grain-receiving chamber, in connection with rotary fans, a rotary grain-discharging plate and a self-adjusting valve, all being arranged in such a manner as to insure a perfect operation of the blast upon the grain and a thorough separation from each other of the light grain, sound grain and light impurities. T. H. C. Mey, of Buffalo, N. Y., is the inventor.

Horse Cage.—This invention relates to a new and improved device for confining while being shod horses and other animals. The object of the invention is to obtain a device for the purpose specified which will be simple in construction, easily manipulated, and which will put the horse, even if vicious, under the complete control of the shoer or operator. William G. Hughes, Meriam, Ind., is the inventor.

Carts.—Carts of the ordinary construction in going down hill are stopped or prevented from crowding on the horse by the application of a brake, the shoes of which act simply by friction on the peripheries of the wheels, and the effect of the brake therefore depends entirely upon the power with which the shoes are drawn up against the wheels. But the wheels are generally not perfectly round, and the chains or other parts connecting the brake with the brake lever are liable to stretch, so that in going down long and steep hills, constant attention must be paid to the brake, and even then the cart cannot be prevented from crowding on the horse at short intervals and to subject the same to severe jerks. In order to overcome this difficulty, the body of the cart which forms the subject of this invention is connected to the axle of the driving wheels, so that it can rise and fall in the center, and when the brakes are applied the action of the wheels on the brakes causes the body of the cart to rise and to ride on the wheels, and the weight of the load itself assists in keeping the brakes applied, and preventing the cart from crowding on the horses. H. Holcroft and C. S. Smith, of Media, Pa., are the inventors.

Gas Apparatus.—The object of this invention is to produce illuminating gas, by passing atmospheric air through the vapors of a hydrocarbon liquid. The carbonizer which forms the subject matter of said invention consists in a hollow drum, which is partially filled with a suitable hydrocarbon liquid, and which is occupied by a cylinder provided with an air induction pipe, and flannel or other suitable textile or absorbent material stretched over a skeleton wire frame, which is arranged to rotate in such a manner that the air forced into said drum has to pass through the cloth or other absorbent material, which, being saturated with oil, offers a very extensive evaporating surface, and said air is thereby impregnated with a sufficient quantity of hydrocarbon vapor to produce a good illuminating gas. Ellis S. Archer, of Mercer Street, New-York, is the inventor.

Sawmill.—This invention relates to certain improvements in the mode of hanging the saw, so that its pitch can be adjusted at pleasure; also to certain improvements in the manner of placing and adjusting the guides to prevent the saw from trembling or springing; further, to an improved mode of guiding and supporting the log, and to a sliding friction clutch, in combination with suitable levers and wheels to run the carriages in either direction, by power or by hand, as the operator may desire. Caleb Bond, of Richmond, Ind., is the inventor.

Manure.—This invention relates to the manufacture of artificial manure out of lime and fecal or refuse animal matter, and the invention consists in producing what is termed animalized lime or "manure balls," by inclosing the fecal or refuse animal matter in a shell or envelope made of lime slaked with urine or other fertilizing liquid; it consists further in a combination of urine with unslaked lime, the two being combined either under pressure higher than that of the ordinary atmosphere, or under ordinary atmospheric pressure, so that the lime is slaked by the action of the urine, and when pressure is applied the lime is caused to absorb a much larger quantity of the liquid than it does when combined with the same under the ordinary atmospheric pressure. A. F. Musselman, of Paris, France, is the inventor.

Water-elevating Device.—This invention relates to an improved water-elevating device in which a rope and bucket are employed. The improvement consists in an improvement in the means employed for tilting the buckets, and in a self-acting pawl and ratchet arrangement for preventing the casual descent of the buckets into the well, as also an improved manner of attaching the rope to the bails of the buckets. H. J. Bailey and S. S. Williams, of Pittsburgh, Pa., are the inventors.

Cheese-curd Cutter.—This invention consists in a feed-box provided with a series of stationary knives and with an automatically-feeding follower in combination with a reciprocating gate containing two sets of knives, the cutting edges of which are situated in places at right angles to each other and to the cutting edges of the stationary knives in the feed-box in such a manner that by the action of the automatically-feeding follower the curd is forced through the stationary knives; on passing these knives it is brought in contact with the knives in the reciprocating gate, and thus cut up in three different directions and in pieces of uniform size. F. G. Abbey, of Sandisfield, Mass., is the inventor.

Hop Frame.—This invention consists in the employment of sticks suspended from the main wire by means of hooks and connected by short cords or wires to a stake driven in the ground, in such a manner that the stake and sticks combined take the place of the training wire, and by the use of the sticks a firm support is given to the hops which is not liable to sway to and fro, and preserves the hops from injury by high winds; and, furthermore, the sticks can be readily reached and unhooked from the ground, and the gathering of the hops is thereby considerably facilitated. L. S. Mason, of Littlefield, N. Y., is the inventor.

Pneumatic Way.—In the pneumatic ways heretofore constructed for the transmission of letters, merchandize, etc. it has been most common to exhaust the tube in front of the carriage or of the piston attached thereto and allow the carriage to be drawn through it by the pressure of the atmosphere. It has also been proposed to drive the carriage by admitting compressed air into the tube behind it, the portion of the tube in front being open to the atmosphere. The object of this invention is to obviate some objections to which both these plans are liable, to bring the whole system under more perfect control and to economize power ; and to these ends it consists in the employment of a continuous viaduct or system of tubing, forming a complete circuit arranged to form two lines between the termini of the way, and an air pump so arranged in the said circuit, and so operated by power suitably applied that the whole volume or body of air is separated, within the said viaduct or tubes, from the external atmosphere and free from its influences, may be made to revolve like an endless belt throughout the entire circuit of the tubes passing and repassing continually through the pump, and returning to the exhausting side thereof with the same velocity that it is delivered from the opposite side without any tendency to a vacuum, and being constantly direct-acting and retro-active to an equal extent, so that it operates with equal forces in the two lines of tubing, and enables one to be used for carriages to run in one direction and the other for them to run in the other direction between the trunnions of the way. E. P. Needham, of New York city is the inventor.

Ore Amalgamator.—This invention relates to a new and improved apparatus for more effectually separating gold and silver from the crushed ore or "pulp," as it is frequently termed among miners. The invention is applicable to what is known as the Chilian crushing mill or to any of the ordinary amalgamating pans in which a rotary muler is employed; in fact it may be used in all cases where the gold and silver are separated from the pulp by means of stirring and agitating the latter in connection with amalgamated metal surfaces. The invention consists in the employment of a series of amalgamated plates secured at proper distances apart and connected with any suitable moving parts which will admit of the amalgamated plates being drawn through the pulp. A. W. Hall, of New York city, is the inventor.

Horse Hay-fork.—This invention consists in the employment of a fork constructed with two bars having two or more tines attached to each, the bars being pivoted to a standard provided with a spring catch, and all arranged in such a manner that the hay will be grasped firmly and elevated to the desired spot and then discharged by an automatic tripping arrangement. David Lippy and John H. Palm, of Mansfield, Ohio, are the inventors.

Window Blind Fastening.—This invention relates to a new and improved fastening for securing the slats of window blinds, in an open or closed state, or at any point between these two positions. The object of the invention is to obtain a simple fastening for the purpose specified, one which may be constructed at a reasonable cost, not be liable to get out of repair, and one which will not interfere, at any time or in any position in which it may be adjusted, with the window sash. J. D. Burdick, Ashway, R. I., is the inventor.

Domestic Boiler.—The object of this invention is to prevent, as much as possible, the fat and gravy from the meat from dripping into the fire and producing smoke, blaze or unpleasant smell, and so enabling broiling to be performed satisfactorily over an anthracite or other fire. It consists in the combination of two series of bars arranged one above the other at a short distance apart, the lower ones having their upper surfaces of trough or gutter shape, and the upper ones upon which the meat rests being narrower and beveled toward the bottom to a thin edge, so that the fat and juices from the meat running down their sides will drop into the gutters or troughs of the lower series and not into the fire. It also consists in the arrangement of the several bars so that the gutters or troughs of the lower ones all lead to one point where the fat and gravy may be collected, and whence they can be poured off either for use with the boiled meat or to be saved for any other purpose. George T. Teel, of Hoboken, N. J.. is the inventor of this improvement.

Self-centering Chuck.—This invention consists in the use of three, more or less, inclined or converging guide-ways in combination with the jaws of the chuck to which a sliding motion is imparted by a central screw or other suitable means; that said jaw, on being forced out in the converging guide-ways, will contract concentrically and clamp an article placed between them and hold it firmly, and in the true center of the lathe spindle to which said chuck is attached. Edgar B. Beach, of West Meriden, Conn., is the inventor.

© 1864 SCIENTIFIC AMERICAN, INC.

Quartz-breaker—In this device the quartz is introduced within a hopper formed by the Union of two crushing jaws, one of which is stationary, the other movable. A special feature consists in imparting a downward motion to the movable jaw, as well as a lateral movement toward the stationary jaw. The quartz is thus crushed and ground in the most effective and speedy manner. J. W. Staunton, of Black Hawk Point, is the inventor.

Sorghum Evaporator.—Several novel features are represented in this improvement, one of which consists in proving the front edge of each of the evaporative compartments with a permanent skimmer, so arranged that, as the liquid flows down from one division into that next below, its floating scum will be completely arrested and removed by the skimmer. The labor of the attendant is thus very essentially reduced. L. Wright, Wapella, Ill., is the inventor.

MISCELLANEOUS SUMMARY.

THE RAVAGES OF INSECTS A CAUSE OF THEIR DESTRUCTION.—It is well known that after worms have for five or six years committed their ravages on the trees of a region, they suddenly disappear, and have no full return again for two or three or more years to come. It has been shown that the destruction is sometimes at least a result of their numbers. The larves or worms, when very numerous, consume the leaves of the tree on which they are before they attain full maturity, and, as a consequence, they never pass to the chrysalis state; they remain for a while as larves, often showing by their movements that they are half-starved, and then die.

MORID'S PROCESS FOR RECOVERING WRITING ON PAPER OR PARCHMENT WHICH HAS BECOME NEARLY EFFACED.—The paper or parchment written on is first left for some time in contact with distilled water. It is then placed for five seconds in a solution of oxalic acid (1 of acid to 100 of water); next, after washing it, it is put in a vessel containing a solution of gallic acid (10 grains of acid to 300 of distilled water); and finally washed again and dried. The process should be carried forward with care and promptness, that any accidental discoloration of the paper may be avoided.—*Cosmos.*

PATRIOTIC AND GENEROUS.—Borden & Co., owners of a factory for condensing milk and the manufacture of cheese, in Winsted, Conn., offered recently to condense and forward to the army all the blackberries the people of the surrounding country would furnish them. At last accounts over eighty bushels of berries had been deposited at their factory for that purpose. The company are making meat biscuit for the army, and have recently "condensed" an entire ox.

EFFECT OF ATMOSPHERIC PRESSURE IN GUNNERY.—The French artillerists in Mexico have recently found, to their surprise, that the angle of elevation used in France for their guns, for any given range, does not afford the calculated results; and have ascertained that this is owing to the diminished pressure of the atmosphere on the Mexican plateau. It follows that cannon may serve as a kind of barometer for measuring altitudes.—*Les Mondes*, July 7.

ACCLIMATION OF ENGLISH BIRDS IN AUSTRALIA.—The thrush, black bird, skylark, starling, chaffinch, various sparrows, and the wild duck, are already domesticated in Australia through the efforts of the Acclimatization Society of Victoria. Great success has also attended the Society's efforts to introduce good fresh-water fish into the rivers, and it is expected that the salmon will soon be naturalized in Tasmania.

PRIZE TO MR. RUHMKORFF.—The prize of 50,000 francs, offered by the Emperor Napoleon for the most useful application of electricity, has been awarded to Mr. Ruhmkorff for his induction coil. The king of Hanover, having heard of the award, forwarded to Mr. Ruhmkorff a large gold medal, "pour le merite," *Reader.*

A NATIONAL Boiler Insurance Company has been formed in London to afford the means of providing against the risks of loss, both of property and life, from the explosion of steam boilers.

[The best insurance for steam boilers is good engineers.—EDS

PLEASURE SEEKING AT SOME PROFIT.—A Saratoga letter writer records the following novel mode of paying hotel bills:

Among the anomolies of a depreciated paper currency the following is noteworthy: There are at present at the Springs quite a number of Cubans—never before so many. They all come laden with gold, on which at home they have paid no premium. On the liquidation of their board bills they are allowed the premium, of course. The practical result is, that when a Cuban has been here a month, and feasted well, he lays down one hundred dollars in gold, and receives in return a receipted bill, with one hundred and fifty-six dollars in change! The Cubans, hence, are living gratis, and making money by it besides! Of course, they are greatly enjoying themselves at our expense.

FERMENTATION AND FERMENTS.—M. Lemaire denies that a special ferment for every kind of fermentation exists. He finds the same microscopic beings present whether sugar is being changed into alcohol, or alcohol into acetic acid. But in the case of natural animal and vegetable matters he has assured himself that microzoa begin the decomposition, which, when the matters become acrid, is carried on by microphytes. By means of a little acid, these latter may be made to appear at will, and the author consequently argues that mycoderms do not make the acid but appear in consequence of its presence. The acidity of the perspiration it is thought may cause the development of certain microphytes which are observed in some obstinate cutaneous affections.—*Dublin Med. Press.*

NEW CURE FOR CROUP.—Several cases have been reported in a French journal, in which croup was successfully treated with a mixture of perchloride of iron, in the proportion of fifteen drops in four ounces of water, given in tablespoonful doses every five or ten minutes. The effect is to detach the false membrane, which is expelled by coughing. The remedy can scarcely be called a specific, as there were several failures, but anything promising to afford relief should be known in so dangerous a disease.

EXTENSIVE FROST IN JUNE.—We have received the Bi-monthly Report of the Agricultural Department for June and July, an unbound pamphlet of 23 pages. Among the matter is a collection of reports in relation to the frost which occurred over all the northern portion of the country on the 9th and 10th of June. It extended from Maine to Minnesota, and as far south as New Brunswick, N. J.

VALUATION OF NEW YORK CITY.—The Commissioners of Taxes and assessments of New York value the real estate of the city at $410,774,435 for the year 1864, against $402,187,382 in 1863. The personal estate amounts to $223,920,505, an excess over 1863 of $31,953 34. The net increase is $40,640,397.

THE costliest Bible ever made in this country was gotten up by the people of Baltimore as a testimonial for the President in honor of his proclamation of emancipation. The cost of the book being nearly six hundred dollars—$580 75. It is a pulpit Bible, bound in violet silk velvet.

AN interesting communication from Mr. V. B. Le Van, of Philadelphia, on the "Power of a newly Patented Steam Engine," has been accidentally overlooked for a month or more. We are obliged to Mr. Le Van, and hope to hear from him on another occasion.

THE young lady pupils of the Buffalo schools are to receive prizes for the "best loaves of bread." There is a good deal of common sense in that, Good loaves of bread are quite as worthy of prizes as good essays in Latin.

FASTENINGS OF ARMOR PLATES.—In the experiments at Shoeburyness, it has been found that armor plates fastened to ships' sides by large wood screws hold much better than those secured by through bolts and nuts.

IT is stated that in the first two years of the present war 28,000 walnut trees were felled to supply a single European manufactory of gunstocks for the American market.

THE American Wood Paper Company at Providence, advertise for 10,000 cords of wood suitable for their purpose. Success to them.

A New Alloy for Bells.

Le Moniteur Illustre des Inventions says that M. M. M. H. Micolon has just patented a new alloy suitable for numerous articles, such as bells, hammers anvils and other non-cutting instruments. The alloy consists of iron, manganese and borax. The proportions given in the specification are—

20 parts of iron turnings or tin scraps.
80 parts of steel.
4 parts of manganese.
4 parts of borax.

But it states that these proportions may be varied. If it is desired to augment the tenacity of this alloy, two or three parts of wolfram (Franklinite) may be added. The iron and steel are placed first in a crucible, afterwards the manganese and borax, and the crucible is then filled with charcoal. It must be poured rapidly into the molds. Bells are thus obtained possessing the sonorousness of silver and costing less than bronze.

SPECIAL NOTICE.

EDWARD HAMILTON, assignor of NELSON GOODYEAR, of Chicago, Ill., has petitioned for the extension of a patent granted to him on May 27, 1851, for an improved mode of preventing the entrance of dust, etc., into railroad cars.

It is ordered that the said petition be heard at the Patent Office, Washington, on Monday, May. 8, 1865.

All persons interested are required to appear and show cause why said petition should not be granted. Persons opposing the extension are required to file their testimony in writing at least twenty days before the final hearing.

A READY way of imitating ground glass is to dissolve Epsom salts in beer, and apply with a brush. As it dries it crystallizes.

Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, Aug. 31, 1864, to Wednesday, Sept. 6, 1864:—

T. T. & B., of N. Y., $10; C. E. W., of N. Y., $45; G. H., of N. J., $40; L. A., of N. Y., $40; A. E. K., of Pa., $50; W. J. W., of Ohio, $20; W. F. S., of N. Y., $20; J. S., of Ohio, $20; E. C. C., of Mass., $20; A. W. H., of N. Y., $15; D. N. D., of N. J., $45; R. R. S., of N. Y., $45; J. W. N., of Conn., $45; W. H. G., of N. Y., $20; F. T., of N. Y., $15; C. & T., of Conn., $15; E. R., of N. J., $32; A. T., of Conn., $25; B. & G., of Conn., $25; H. W., of Wis., $16; M. S., of Ill., $20; J. A. McP., of N. Y., $15; E. C., of Conn., $35; F. C. W., of Conn., $16; J. J. S., of Conn., $25; H. G. D., of Ky., $30; N. N., of R. I., $25; W. F. Q., of Del., $16; J. M. H., of N. Y., $25; N. H. B., of N. J., $25; J. H., of N. Y., $20; C. J. VanW., of N. Y., $40; V. G., of N. Y., $15; P. L. M., of Ohio, $10; J. H., of N. Y., $20; H. R., of Austria, $15; J. L., of N. Y., $20; P. L., of N. Y., $20; J. F., of Ohio, $30; C. P., of Ohio, $20; T. G. M., of N. Y., $20; E. M. C., of R. I., $20; C. S., of N. Y., $20; W. E. D., of N. Y., $35; H. C., of N. Y., $20; J. E. S., of N. Y., $15; H. B. M., of Mich., $30; J. G., of Pa., $25; T. H. W., of Pa., $16; W. B. M., of Mich., $15; A. W. C., of Vt., $30; H. F. W., of Mass., $15; C. H. N., of N. H., $20; H. G. W., of Iowa, $30; C. M. J., of Ill., $36; J. S., of N. Y., $30; T. C. W., of Mich., $41; G. H. S. D., of N. Y., $60; C. E. W., of N. Y., $45; S. G., of N. Y., $45; L. & L., of Ohio, $20; E. S. A., of N. Y., $45; J. N., of Ill., $20; A. H., of Ky., $45; A. S. H., of N. Y., $15; W. H., of Iowa, $20; G. I., of Pa., $20; C. A., of N. Y., $10; J. F., of N. Y., $15; J. B., of R. I., $20; W. B., of N. Y., $15; E. L. P., of N. Y., $40; H. W. B., of N. Y., $25; E. R., of Mich., $15; P. J. G., of N. Y., $15; J. K., of N. Y. $30; J. H., of Ill., $25; E. W. M., of Ill., $25; W. H. W., of N. Y., $15; L. M. D., of N. Y., $25; C. C. B., of Iowa, $36; D. H. S., of Conn., $16; L. T. D., of R. I., $35; F. S., of Pa., $25; C. A., of N. Y., $12; E. H. T., of Conn., $50; W. & S., of N. Y., $40; S. B. H., of Mass., $60; C. H. R., of Maine, $16; G. E. H., of Maine, $15; J. D., of N. Y., $450; H. R., of N. Y., $25; C. C. & V., of N. Y., $20; W. B., of N. Y., $28; J. L., of Iowa, $25; R. & K., of N. Y., $25; A. B., of Ohio, $20; G. & C., of Conn., $19; J. G., of Ohio, $20; P. D. S., of Nevada Territory, $25; A. K., of Ill., $25; J. W. B., of Mass., $10; J. R. E., of U. S. A., $25; A. & H., of Conn., $605; S. S., of N. H., $20; J. A. D., of Ill., $20; A. S. of N. Y., $20; R. T., of N. Y., $15.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, stating the amount and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office, from Wednesday, Aug. 31, 1864, to Wednesday, Sept. 6, 1864:—

G. H., of N. J.; N. H. B., of N. J.; J. M. H., of N. Y.; H. G. W., of Iowa; H. W. B., of N. Y.; D. D., of Ill.; E. R., of N. J.; E. W. M., of Ill.; J. J. S., of Conn.; H. N., of R. I.; T. C. W., of Mich.; C. E. W., of N. Y.; B. & G., of Conn.; H. G. D., of Ky. (2 cases); H. B. M., of Mich.; G. D., of Mass.; J. G., of Pa.; E. C., of Conn.; C. C. B., of Iowa; T. T. & B., of N. Y.; J. S., of N. Y.; E. L., of England; J. H., of Ill.; W. T., of Conn.; A. W. C., of Conn.; J. K., of N. Y.; L. M. D., of N. Y.; H. B. S., of Wis.; W. H. G., of N. Y.; E. L. P., of N. Y.; D. J., of England; R. & K., of N. Y.; C. A., of N. Y.; E. H. T., of Conn. (2 cases); J. G., of Ohio; S. B. H., of Mass. (2 cases); H. F. B., of Mo.; P. D. S., of Nevada N.; W. & S., of N. Y.; A. K., of Ill.

© 1864 SCIENTIFIC AMERICAN, INC.

Some Facts about Diamonds.

From Dr. Feuchtwanger's treatise on gems we take the following statements in reference to the diamond:—

"A letter was lately published from Sir David Brewster, on a curious optical phenomenon that had occurred in the construction of a diagonal lens. The diamond, previous to working, had all the appearance of internal brilliancy; but, after being polished, it presented a series of stratified shades, which rendered it useless for the required purpose. It afterwards appeared that lapidaries were acquainted with this appearance, which rendered them extremely unwilling to take the risk on themselves, of cutting up diamonds for optical purposes. On a minute examination of this phenomenon, it appeared that these different shades occurred in regular strata, each section being about the one-hundredth part of an inch, and each stratum having a different focus, and being of a different degree of hardness and specific gravity. The inferences drawn from the above facts were—that the diamond was a vegetable substance, and that its parts must have been held in solution and subjected to different degrees of pressure at different stages of existence. If, on the contrary, as it has been generally believed, it is subject to the laws of crystallization, its crystals must necessarily be homogeneous.

"The diamond being the hardest of all substances, yields to no file; scratches all other minerals, and is not touched by any. This character has become the most important of the diamond since the late discovery of the amorphous or compact diamond. It is very frequently tinged light-green, but more rarely with orange, red, blue, or black; but in setting, these shades disappear, particularly in the smaller diamonds; but there are also known diamonds of rose and pistachio-nut green colors. The blue color is very rare. The blue diamond of Mr. Hope of London, is one of extreme beauty and rarity, and is of immense value; the yellow diamond in the Museum of Natural History, in Paris, is likewise very remarkable for its color and size. The black diamond, which is perfectly black, although plainly crystallized, occurs most frequently in small bristled balls, but crystalline points: the crystals are very small grouped together in an irregular manner, and extremely refractory to the cut; it is considered the hardest of all diamonds. The green diamond is also very rare, but I have seen some beautiful specimens in the Jardin des Plantes and in Freiberg, the first in the cabinet of Abbe Hauy, and the latter in the cabinet of Werner.

"In Russia, the first diamond was discovered in July, 1829, by Humboldt and Rose, when on their journey to Siberia, on the west side of the Uralian mountains, in the gold-washing establishments of Krestowosdwisheaski, belonging to Count Schuwalow. The locality, in connection with the other circumstances of the place where the diamond was found, bears a striking resemblance to the diamond district of Brazil. The predominating rock of the spot on the Uralian mountains is a quartzose chlorite, talcose schist (itacolumite), with an admixture of iron pyrites and mica, wherein we find beds of red oxide of iron, talcose schist, limestone, and dolomite.

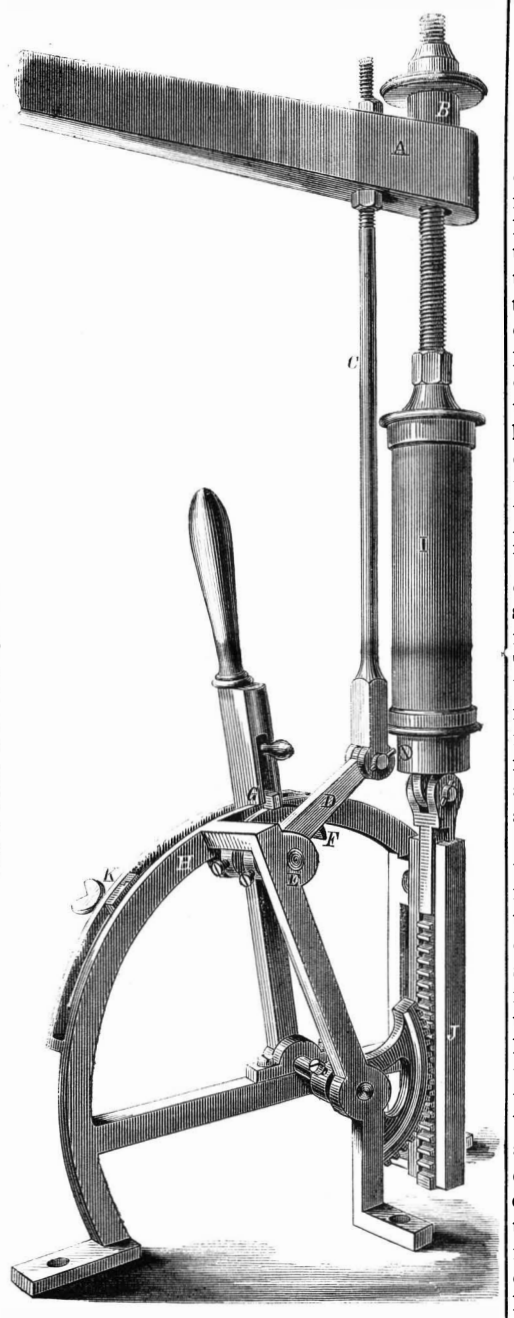
"At a most extensive sale of diamonds, which took place in the summer of 1837, at the auction of Rundell & Bridges, London, there were twenty-four lots put up, which produced the sum of forty-five thousand eight hundred and eighteen pounds, nearly two hundred and twenty-nine thousand dollars! Some of the prices were as follows:—The celebrated Nassak diamond, which weighs three hundred and fifty-seven and a half grains, and is of the purest water, was purchased for thirty-six thousand dollars. It is considered to have been sold at a price considerably under its value. A magnificent pair of brilliant ear-rings, weighing two hundred twenty-three and a half grains, formerly the property of Queen Charlotte, were bought for fifty-five thousand dollars, a price infinitely below their usually estimated value. A sapphire, seventy-five and a half carets, set with brilliants for a brooch, two thousand four hundred and sixty-five dollars.

"According to Spix and Martius, there have been produced in Brazil, from 1772 to 1818, 1,298,037 carats of diamonds—that is, in the time of the Royal Administration; but that during the Lease, only 1,700,000 carats were produced, which together make 2,998,037 carats, or 1301¼ pounds, thus averaging from fourteen to fifteen pounds per year; those brought into market by contraband being excepted.

"The largest diamond is in the possession of the Grand Mogul, and according to Tavernier, resembles in form and size, half a hen's egg. Its weight is two hundred and ninety-seven and three-sixteenths carats. It was found in 1552, in the mine of Colore, a short distance to the east of Golconda, and is valued at 11,723,000 francs. It is cut as a rose-diamond, and is perfectly limpid, with the exception of a small flaw at the end of the girdle."

HUNTINGTON'S SELF-ACTING SAFETY-VALVE.

When a safety-valve rises to let off steam it does so gradually and gently, and as the pressure increases it continues rising until it can go no further. In many cases the distance to which the valve lifts is not



equal to the area of the pipe, so that the passage is much obstructed, and the boiler unnecessarily strained in consequence. The machine shown herewith is designed to obviate this evil, and to permit the steam to blow off as fast as it is formed. It is self-acting, and requires no attention; when it is once set the engineer may leave the cab and go to his dinner in perfect confidence that the valve will unhook itself at the proper time if the pressure becomes too great. No slacking off of the spring balances is required with this arrangement, as a single motion of the lever throws the balances up so that they are relieved from strain.

In the engraving the front of the spring balance is toward the engineer, as usual, and the safety-valve lever, A, is shown running from it to the dome. The rod of the spring balance passes through this lever and has a nut, B, on top to regulate the pressure.

There is an additional rod, C, which passes through the lever and connects to an arm, D, on the shaft, E. This rod trips the valve-lever, A, through the medium of the toe, F.

It will be seen that as the valve lifts, the small rod is drawn up, so that by degrees the toe, F, rises against the stop, G, which sets in a slot in the quadrant, H. When it has raised far enough to trip the toe or throw the stop, G, out of its seat, the lever, A, flies up immediately and quickly enlarges the area of the safety-valve passage. The spring balance is only held down by the rack and sector, J, and these in turn are held by the shallow recess in the quadrant, H, so that when the stop is pushed out by the toe, F, the lever goes up instantly, as before described. The check piece, K, limits the distance to which the valve lever rises, and it may be set at any point desired.

This invention was patented through the Scientific American Patent Agency, February 9th, 1864. For further information address Wm. S. Huntington, Andrusville, N. Y.

THE CALORIMETER OF BOILERS.

It is always well that terms should be exactly understood. The word "calorimeter" is so strictly technical that many of our readers might possibly be at a loss to comprehend its meaning without some definition. The calorimeter of a boiler, then, is simply the area of the orifice or orifices of its flue tube or tubes, and the proportion which this bears to the area of the interstices of the fire grate exerts a very important influence on the economical and positive efficiency of every steam generator. It is a pity that this fact has hitherto been very much over looked. It is too much the custom to construct boilers with the largest possible amount of tube surface, under the idea that thereby heat which would otherwise be wasted is saved up and converted to a useful purpose. The fact is, that the generation of caloric by combustion is one thing, and its subsequent use quite another; and, as we have before endeavored to show, the value of heating surface depends on a great many conditions, independently of its mere extension. Thus, boilers with crowded tubes cannot steam well because the contact of the water with the metal surfaces is prevented by films of that steam which cannot disentangle itself from the water with sufficient rapidity for want of room. There is in such boilers a want of circulation, and the result is that the tubes are burned out.

It is well understood now that very small and long tubes are inefficient. Stephenson's long boiler locomotive could not make steam without such a contracted blast-pipe that all the saving due to the reduction of temperature in the smoke-box was re-absorbed by back pressure in the cylinders. The locality of the waste was changed; its amount remained unaltered. The larger a flue tube is within certain limits the better; but if it is attempted to keep up the superficial area of heating surface by increasing their number, it is certain that the calorimeter must be injuriously increased in a nearly equal proportion; and it follows that a boiler with a few tubes of moderate diameter will be actually more efficient and more economical than one with either a greater number of tubes of equal diameter, or another with a larger number of tubes of small diameter, although the calorimeter is thereby in some degree kept within proper limits; and this is especially true of coal-burning engines. This statement may appear paradoxical; it is not the less true. In the first place, large tubes, from reasons which we pointed out in a recent article, permit a certain amount of combustion to go on within them. This cannot take place in very small tubes. The value of any heating surface increases in a very rapid ratio with the intensity of the heat to which it is exposed, and it follows that, as very small tubes cannot be traversed by flame, or even by very highly heated air—most of the caloric being given up in the first foot of length—they must be inferior inch for inch to those of fair dimensions, say three inches in diameter. If to this we add the loss due to contracted water-way, and the absence of circulation, it is easy to see that a limit is quickly reached beyond which no advantage whatever can be derived from the extension of tube surface. The worst defect

© 1864 SCIENTIFIC AMERICAN, INC.

of all, however, consequent on the presence of too many tubes, large or small, is found in the increase of the calorimeter, which is the real measure in all practical boilers—or, if not, it should be—of the quantity of air passing through the burning fuel. The great secret of success in boiler engineering is involved in the admission of just air enough, and no more, to complete the combustion of the fuel upon the grate. The temperature of a furnace is the measure of its economic evaporative efficiency, and this depends solely on the quantity of air which passes through it in a given time. For instance, with the best hard coke the temperature produced by just sufficient air to completely oxidize it will be about 4·347° Fah. If twice this quantity of air is admitted, the resulting temperature will be only 2·347°, and the evaporative value of the heat in the first case will be perhaps three times that produced in the second case, although the rate of combustion may be in both cases equal, or nearly so, and consequently the entire quantity of caloric expended precisely the same. A practical illustration of this fact is given every time a fire-door is opened to check the production of steam. A two-fold action ensues. The rapidity of combustion is moderately reduced at once, while the air rushing in absorbs so much heat from the fuel that very little remains to be imparted to the boiler. It is a mistake to imagine that the flues are absolutely cooled down. Their maximum temperature can only at most, be a very few degrees above that corresponding to the existing pressure within the boiler; and yet is certain that the heat of the entering air must, by the time it reaches the flues, be greatly in excess of this. The cooling action is indirect, not direct; and it implies a reduction in the quantity of caloric poured into the water, not a reabsorption of that already there. Indeed, it is possible that the temperature within the tubes is but moderately lower, in the few minutes after the door is opened, than it was before. But from what we have already said on the value of intensity, it will be easily understood that a very moderate reduction in this element will produce a very considerable reduction in the quantity of steam produced in a given time.

The most valuable experiments ever conducted on the relation of the calorimeter to the efficiency of a boiler were undertaken and carried out by Chief Engineer Isherwood, of the United States' Navy. We have before now taken exception to his views on expansion, and nothing has occurred since to lead us to form different opinions; but there can be no doubt that Mr. Isherwood is a careful experimenter, and all that he states is, therefore entitled to due consideration. In order, then, to settle this question, he selected a boiler of the ordinary return flue marine type, driving the machine shop of the New York navy yard. This boiler is 12 feet long, 7 feet 6 inches wide, and 12 feet high without a steam dome; the furnaces are two in number, 6 feet by 3 feet; the crowns 22 inches above the bars in front and 28 inches at the bridge. The lining plate of each furnace door is perforated with 100 3-8th-inch holes, on Williams's principle. The tubes are 144 in number, 3 inches diameter outside, and 8 feet 3 inches long. They are nine rows in hight, occupying a vertical space of 37 inches. The experiments were made by stopping up certain tubes with iron plugs; the fuel used was anthracite, and the results obtained were as follows:—

	Rate of combustion.	Area of heating surface.	Economic efficiency.
With all the tubes in use.....	1·000	100·00	1·000
With the 2 upper horizontal rows stopped.....	1·142	83·24	1·069
With the 3 upper rows stopped.	0.840	74·87	1·168
With the 4 upper rows stopped.	0·891	66·48	1·192
With the 2 lower rows stopped.	0·868	83·24	0·924
With the 3 lower rows stopped..	0·955	74·87	1·000
With the 4 lower rows stopped..	0·923	66·48	1·030
With the inner 2 vertical rows of each boiler stopped.....	0·874	81·15	0·930
With the inner 3 rows stopped..	0·990	71·72	0·965
With the inner 4 rows stopped..	0·951	62·29	0 990

Now two remarkable facts may be gleaned from this table. The first is, that, with the exception of the experiments with two rows of tubes suppressed, when the economic evaporation fell off 3 per cent, the economic evaporative efficiency increased a little with each diminution of tube surface and calorimeter, until, when four rows were stopped up, it had actually increased by 6¼ per cent over that obtained when all the tubes were in use. The second fact is that the tube area bore very little relation to the quantity of fuel burned. The extremes never varied more than 8 per cent. Here, then, we have a boiler the actual as well as the economic efficiency of which increased in a certain ratio as its heating surface was diminished. To what is this to be attributed? Simply to the fact that the calorimeter of all the tubes was so great that a much larger quantity of air than that indispensable for effecting combustion found its way into the fire-boxes, lowering the temperature, and consequently reducing the value of the fire-box surface. Closing an ash-pit damper would have had no effect; the rate of combustion would have been made less, but the proportion which the whole quantity of caloric produced would then bear to the number of cubic feet of air admitted would remain unaltered. In point of fact too much air through a grate is very nearly as fatal to the powers of a boiler as its admission through the fire door. The object had in view is the raising of water to a certain temperature, and its conversion into steam, and every cubic foot of air which enters a furnace above that necessary for complete combustion, carries away a portion of this heat to the chimney. There never was a more erroneous notion than the belief that advantage can be gained from filling a boiler and its tubes with a large volume of moderately heated air; one-half the quantity at a higher temperature would be more than twice as efficient.

We are not, however, to fall into an opposite error and reduce superficial tube area very much in order to keep down the calorimeter. A large tube with a contracted orifice is apparently, but only apparently, the proper thing. Thick ferrules, however, operate injuriously. They permit the existence of a languid current of air at the side of the tube, whether they are driven at the smoke-box or fire-box end. The best means of procuring a small calorimeter and a large tube surface will be found in the use of taper tubes, large at the fire-box end. At the present moment such tubes would be very expensive at first, though we feel no doubt that they would pay for themselves where coal is dear in a very short time. Improvements, however, are daily taking place in this branch of manufacture, and were there but a fair demand, there would soon be a full supply of tapered tubes in the market. It is more than probable that their use would be the greatest improvement of which the tubular boiler is now susceptible.—*London Mechanics' Magazine.*

[The term calorimeter would from its etymology manifestly mean a measurer of heat. It was applied by Lavoisier and Laplace to an instrument employed by them to determine the specific heat of different substances. We should suppose that the area of the orifices of the flue tubes would be a very uncertain indication of the heating capacity of a steam boiler, and therefore that the term "calorimeter" was not a happy selection of a name for this area.—EDS. SCI. AM.

The Iron Business of Lake Superior.

The amount of iron ore shipped from Lake Superior in 1855 was 1,447 tuns against 116,998 tuns in 1860, and 185,557 tuns in 1863. These amounts, especially those for the last two years, fall far below the demand, the difficulty having been in procuring transportation for the ore, and men to mine it. The quantity actually spoken for to supply the various furnaces using this ore, before the opening of navigation in 1862, was over 140,000 tuns, while in 1863, 250.000 tuns would not have supplied the demand.

Large investments have been made in timbered lands, along the lines of the Marquette and Ontonagon, and Peninsula Railroads, as well as on Big Bay de Noquet, with a view to erect blast furnaces for the manufacture of charcoal pig iron. The average value at Marquette of the ore shipped during the past year was $5 per tun, and that of the pig iron produced $45 per tun, giving the aggregate value of the iron product of the country for 1863, $1,327,245,-245.—*Marquette Journal.*

What Fifteen-inch Shot Do.

A correspondent of the New Orleans *Era* says:—

Troops continue to arrive, and the *Connecticut*, a few days ago brought down four hundred sailors from the North which has filled up all our deficiencies, and enables us to effectually man the *Tennessee* aud *Selma*, both of which vessels are doing very excellent service, the former at the fort and the latter about the bay in the shoal places. It must be very galling to the rebs to see the pride of their navy thus used against them. She went in at them last Saturday afternoon, and the fire from both was terrific. The fort struck her nine times but "failed beautifully" of produciug any effect beyond the shooting away of a flagstaff, an anchor and a few fathoms of Chain. But the effect of our 15 and 11-inch shot is truly surprising. The after part of the monster's shield being all strained and shattered, and the angle on the port side aft completely opened apart. They are painting her new smoke-stack and touching her all around, slushing her down, &c.

DUST ON RAILROADS.

There is no necessity for having any dust in railroad traveling. In all parts of Europe, after a ride by rail the traveler does not need to have his coat brushed; the dust is effectually kept down by simply allowing grass to grow over the road. In this country men are employed to dig up every blade of grass and every weed that makes its appearance. The consequence is such a cloud of dust as to make railroad traveling a dreaded martyrdom, instead of a pleasant recreation as it is in other parts of the world.

The New York Central, and the New York and Erie roads are competing lines, and they both spend a good deal of money in advertisements and runners to draw business from each other. If the managers of one of these roads would cover the track with turf, or encourage the growth of grass they would most assuredly secure the monopoly of the through travel. Even roads where there is no competition, we have no doubt would find it to their advantage to adopt this effectual method for abolishing the one insufferable discomfort incident to this mode of locomotion.

The cheapest plan for covering a track with grass would doubtless be to spread manure over it, and sow hayseed. It would perhaps be well to sow rye also, or some other grain, together with the hayseed. This is the right time of year for the operation. Which one of the superintendents will win the blessings of the nation by taking the lead in this invaluable reform?

Cast Cast-steel Car Wheels.

In our list of Patents in the present number will be found that of Charles W. Stafford, Esq., of Saybrook, Conn., for process for *casting* a cast-steel car wheel.

This is a desideratum long sought for, and has heretofore failed of attainment. By the process just patented by Mr. Stafford the wheels are produced directly from molten cast-steel with great certainty and facility and in any of the ordinary forms which may be desirable. The hollow or cavity of the wheel is also susceptible of any variety of form which may be required, and has a smooth and perfect surface.

The great advantages of a cast-steel over a cast-iron car wheel are obvious to the most casual observer. The strength of cast-steel as compared with cast-iron is laid down as being from 5 or 6 to 1. The use of these wheels would afford almost an absolute insurance against all that class of accidents and the consequent damage resulting from broken wheels. Their value will be very great in all cases where a high rate of speed is sought, and also for burden trains on such roads as the Atlantic and Great Western, when it is desired to make long runs without change. The manufacture of cast-steel is in its infancy in this country, and we deem Mr. Stafford's invention a very important step in the right direction.

COLD ROLLING IRON.—Interesting experiments have been made with the process of cold rolling as applied to iron. In one case, on testing specimens of cold rolled iron, a black bar from the rails broke with 26,-173 tuns per square inch, a similar turned bar with 27,119 tuns, and a cold rolled bar of the same iron sustained 39,388 tuns. The elongations, which may be considered as the measure of ductility, were 200 and 220 per unit of strength in the case of ordinary iron, and .079 in the case of the cold rolled iron. A plate of cold rolled iron sustained no less than 51.3 tuns per square inch. Endeavors are being made to apply this invention to railway bars.

MEANS OF HARDENING FRAGILE OR FRIABLE SPECIMENS.—Mr. Stahl gives solidity to friable specimens, even if of loose material like a mold in sand of a shell or bone, by running in a mixture of resin and spermaceti melted together.—*Les Mondes.*

© 1864 SCIENTIFIC AMERICAN, INC.

Correspondence

Concerning Twin Screws.

MESSRS. EDITORS:—Will you permit me to make a few remarks in your highly interesting and valuable journal upon the subject of "Twin Screws" for steam vessels as compared with the practice of using one only? I observe that this subject is meeting with a good deal of attention in print, as well as in the conversations and discussions of engineers and naval men. In the SCIENTIFIC AMERICAN, of Sept. 3d, I notice a letter from Chicago, signed "R. C. B.," giving you an idea of the history of the subject on our Western lakes, drawing conclusions unfavorable to the use of "Twin Screws," except "for special purposes; such as for short trips, where there is much going in and out of narrow and crowded harbors, or for shoal water, where but little immersion can be had."

Having myself served on the Western lakes as an engineer, I can confirm the truth of the statements made by your Chicago correspondent as regards the general historical facts, and also that he correctly represents the prevailing opinions upon the subject held by experienced men on the lakes, but I wish particularly to call your attention to the fact that all naval vessels ought to come within the exception which he explains, and which I have quoted from his letter. That is to say:—

First, All naval vessels ought to be comparatively light draft, because this quality admits them to a greater number of harbors. And every one will now admit that all naval vessels should be very fast. From these facts it will readily be seen that they should come in the same category as those on the lakes, which are built "for shoal water."

Second, All naval vessels should be able to maneuver with the greatest possible rapidity. The London *Times* said that the *Kearsarge* was victorious over the *Alabama* because she had the greater speed, and could therefore secure the advantage of position. Now although we all know on this side of the water that the *Kearsarge* had other advantages, such as greater skill on the part of the officers in conducting the details of the fight, better discipline among her crew, and better drilled gunners, yet the fact that a paper like the London *Times* should say that it was owing entirely to her greater speed giving her the commanding position shows the great importance which is attached to that power, and I think every one will understand that in case of a conflict between two vessels of equal speed, one of them having one and the other two screws, the twin screw could always assume the commanding position. This then brings the naval vessel into the category of those on the lakes which are intended "for short trips, where there is much going in and out of narrow and crowded harbors."

With regard to the improvement in the speed of the lake steamers effected by using but one screw in lieu of two, although I am aware of the fact, I consider it due to causes which have been little suspected by those making the change. Twin screws require a sharper after body of the vessel than the single screw to give them an equally advantageous action upon the water. When, therefore, you remove the two screws and substitute one, you have in effect given a finer run to your vessel, and where this was pretty full, as I well remember the old *Independence* to have been, the improvement in the speed would necessarily have been marked. With a finely modeled vessel, adapted in its form to the twin screws, and with screws well proportioned to their work, I am satisfied the same speed would be obtained with a given boiler power as with the single screw, and in case the draft of water was light compared to the power applied, the twin screws would assuredly give the greater speed.

With regard to the screws becoming foul from spars and rigging going overboard, the single screw would, in all probability, become foul if no precautions were taken to prevent it, and I think it as easily prevented with two as with one, having seen plans which have proved entirely successful with the single screw, and which are equally applicable to twin screws.

NAVAL ENGINEER.

[Our correspondent attaches more importance to the opinions of the London *Times* than we do. Since its course on the Armstrong gun question, intelligent mechanics regard it as the poorest of all authorities on any questions connected with mechanics or engineering.—EDS.

Aerial Navigation.

MESSRS. EDITORS:—I am a firm believer in the practicability of "Aerial Travel," and that the crowning scientific triumph of this eventful century, will be the accomplishment of this much-sought-for and long-desired object. According to my views no aerial machine can be of any practical value unless it combine these essential properties:—It must exert within itself force sufficient to overcome the resistance of opposing winds. Ballooning machines, floating in the current, are only dangerous toys, of no utility, but as objects of curiosity to the multitude, or as a limited means of investigation to the scientific.

Aerial machines must be driven at a very high speed, not less than 50 miles an hour, and as much over that velocity as can be attained. They must possess the power of rising and lowering at all times, so that favorable currents of wind blowing above and below may be made available. The point to which I would call the attention of experimentalists at present, is the construction of their model machines with huge gliding surfaces, so that they will glide upwards. An arrow is made long and slim, convert its materials into a ball, and the bow which made the arrow travel hundreds of yards, will scarcely force it out of your hands. The paper kite held by a string is elevated by the wind sliding against it, roll its materials into a lump, and you cannot place it in any position where any ordinary wind will hold it suspended. Birds of prey and water-fowl glide round and along for hours without any apparent weariness.

In my ultimate views of "Aerial Travel," I entirely discard all inflation. Would space admit of it I would send a description of a model machine, which I will construct this coming year, and also the machinery for driving it. Allow me to make a suggestion before closing. Let us have in New York an "Aerial Ship Convention," where the different parties who are "thinking" on its accomplishment may meet together, try models, and exchange views. I am satisfied it would excite a great deal of public interest both in this country and in Europe, and that it would be largely attended.

J. T. D.

[Our correspondent will excuse us for shortening his communication somewhat. We have retained all that we thought would be of interest to any of our readers.—EDS.

High and Low Velocities.

MESSRS. EDITORS:—In your issue of the 27th inst., under the head of "Iron Plates not Invulnerable," commenting upon the reports of experiments made at Shoeburyness with the 600-pounders, you propose to show that the "complete destruction of a most massive iron-plated target by a 600-pound shot," fired from the 13½-inch Armstrong rifle gun, proves conclusively the soundness of the views which our ordnance officers have urged for many years, viz:—that very heavy shot, at moderate velocity, are more destructive in their effect than lighter shot at high velocity.

Does this experiment, as reported, prove this theory to be correct? To my mind it proves directly the reverse. What are the facts as given in your account taken from the London *Mechanics' Magazine* and the London *Times?* It is stated that a 600-pound shot fired from the 13½-inch Armstrong shunt gun with a charge of 40 lbs. of powder ($\frac{1}{15}$ the weight of the shot) would produce an initial velocity of 840 feet per second at 200 yards. Will our ordnance officers contend that even this low velocity can be given to a 600-pound shot with so small a charge as 40 lbs. of powder? I have it from pretty high English authority that the proportion of charge of powder to the weight of shot usually used at Shoeburyness in these experiments is about $\frac{1}{8}$, and many times a much heavier charge is used. It appears from the report of this experiment that after the "initial velocity or speed at which the 600-pounder moves has been taken by Narvaez's electric apparatus," it is ascertained to be 860 feet per second on leaving the gun. "The gun, therefore, was loaded with a 40-pound charge and a steel shot weighing 303 pounds," leaving exactly 297 pounds, a very fair weight for a shot to be fired at another time. It will be seen that the proportion of charge in this instance was greater than the $\frac{1}{8}$ usually used. Now if, as is shown by "Narvaez's electric apparatus," a velocity of 860 feet per second is given to a shot weighing 600 pounds with a charge of 40 pounds of powder, what will be the velocity given to a *steel shot weighing* 303 *pounds with the same charge?* It appears from the report that it was the 303 pound shot with the high velocity, and not the 600-pounder at low velocity that did the smashing.

I am an advocate of high velocity, and cannot accept such comparisons in proof of the greater destructive effect of shot fired at low velocities, as is given by Major Barnard in his "Notes on Sea Coast Defense," such as "a leaden bullet fired from a pistol will penetrate a pane of glass by a clean hole; the same being thrown by the hand will smash it to fragments."

There can be no doubt but the pane of glass would be smashed by the leaden bullet thrown by hand; glass is known to be a very brittle substance and easily shattered into fragments, and such comparisons do not illustrate the effect of shot fired against iron plates at high velocity. But instead of the glass we use a plate of sheet iron, which would more correctly illustrate the actual result produced upon the iron plate. To throw the leaden bullets with the hand against a plate of sheet iron would be very much like throwing peas against the wall; it would be difficult to tell where they hit. While the same leaden bullet fired from a pistol would penetrate the plate clear through, fracturing it more or less. Now is it the weight of the bullet that produces the destructive effect upon the plate, or is it the velocity?

I am decidedly in favor of the Government making 20, and even 30-inch guns. No doubt they will have their "mission" as the "Ericsson monitors" have had theirs. But in my humble opinion lighter guns, possessing greater strength, throwing shot of less weight, with high velocity, will win the battles in actual contest, and decide the fate of the nation.

H. F. MANN.

Pittsburgh, Pa., Aug. 29th, 1864.

[If our correspondent will read the account of the London *Times* carefully, he will see that it is stated distinctly that the shot tried—the 303-pound steel shot—moved at the velocity mentioned—840 feet per second.—EDS.

A Whitewash that will Keep.

MESSRS. EDITORS:—How can I make a whitewash that will always be ready for immediate use.

J. C. B.

Albany, Sept. 3, 1864.

[If whitewash, made of lime and water, is brought in contact with carbonic acid, the lime enters into combination with the acid, forming carbonate of lime. Water usually contains carbonic acid, for if brought in contact with carbonic acid gas it absorbs its own bulk of the gas. When whitewash is made, therefore, a portion of the lime is immediately converted into carbonate of lime. The water being thus freed from its carbonic acid, gradually absorbs a fresh supply from the atmosphere and the process of converting the lime into carbonate continues. This carbonate of lime is not adhesive, and its mixture in the whitewash impairs the quality of the wash. In order to make a whitewash that will keep, the carbonic acid should be expelled from the water before the lime is introduced, and the wash should then be excluded from the atmosphere. The acid may be expelled by boiling the water, and it may be prevented from returning by keeping the whitewash in a tightly corked bottle.—EDS.

1,000-Pounder Cannon.

MESSRS. EDITORS:—I take pleasure in informing you that after a great many delays the great 20-inch sea-coast gun has arrived at its destination. On the morning of the 25th the Bishop's derrick was towed down the bay with the gun on board, at 11 A. M., it landed at the United States wharf at Fort Hamilton. The gun was raised about 9 feet, and landed in safety in 30 minutes on an oak cradle prepared for that

© 1864 SCIENTIFIC AMERICAN, INC.

purpose. The engineers have commenced to move it to solid ground for fear of its great weight crushing the stone dock. It is moved on 4-inch iron rollers on oak ways which, like the cradle, are plated with iron, the power is a four-fold tackle with two successive luff-tackles, it will be moved about 40 or 50 yards a day. The platform will be ready in time to receive the gun. A CONSTANT READER.

New York, Aug. 28, 1864.

A Singular Steam Engine.

We have seen a number of novel steam engines in our time, but the one described in the following account by the *Herald* reporter rather exceeds any we ever met with.

"I cannot refrain from giving an account of the building of a very small steam engine, the materials of which were picked up in different parts of the State and suited to their proper places at the leisure of the builders. A description of the materials used, and where procured, will be of interest, and any one anxious to procure relics of the war would find in this small engine a whole cabinet of curiosities. The length of this piece of Yankee ingenuity is fourteen inches, and its height ten inches, and, though so small, yet it works beautifully. The bedplate, a small brass plate, was taken from a mill at Port Royal. The cylinder bed, on which the builder's name is generally engraved, was taken from a small engine used for washing gold at the gold mills on the Rapidan river. The way stand is made from a piece of the balance beam of Fairbanks' scales. The cylinder is from a piece of musket barrel. The steam pipe is a silver pen-holder, as also the exhaust pipe. The steam whistle is composed of several pieces; the head the mouthpiece of a bugle, the cap a cartridge of Spencer's repeating rifle, and the knob the tip of a bayonet scabbard. The hub of the flywheel is the plug of a shell fuse, The four spokes are made from a Springfield musket ramrod, the rim from a center table taken at the Spottsylvania Court House. The safety valve is another piece of bugle, helped out by a piece of lightning rod taken from a mill at Rappahannock station. The beam of the valve is a cavlaryman's buckle filed down; the weight a knob of a bureau drawer from Spottsylvania Court House; two try cocks from Fairbanks' scales, taken at Rappahannock station. The boiler is made from a common oil can; the furnace from a camp kettle, as also the smoke-stack. The frame upon which the whole rest is mahogany, made from a piano taken from the house of a major in the rebel army. The rests or legs to the frame were taken from a pair of andirons from the same house The rests of the boiler came from a snare drum. The builders of this beautiful little engine are W. E. Hawkins, of Newport, N. Y., and A. R. Evans, of Utica, N. Y., both of Company H, Forty-fourth regiment New York Volunteers. When we take into account the scarcity of materials and tools to make such a nice piece of mechanism, and the length of time taken to complete it—being under process of construction nearly three years—it certainly becomes quite a curiosity, and one that would prove a valuable acquisition in the way of historical records and relics.

A New Submarine Boat.

The *Herald* of the 9th inst. speaks of a new torpedo boat recently invented by Chief Engineer Wood, U. S. N. This vessel is designed to explode a torpedo in contact with a ship's bottom, and is an entirely new conception. The following description of the vessel is taken from the *Herald* reporter's account.

She is a wooden vessel, seventy-five feet in length, twenty feet beam, and seven feet depth of hold. She is built in the most substantial manner, with heavy beams supported by hanging knees, securely bolted and fastened. The deck is crowned about two feet fore and aft, and about as much athwartships, and this will be covered with a thickness of iron armor sufficiently strong to make it shot and shell proof.

The vessel will sit very low in the water under any circumstances; but when not actively employed she will float some twenty odd inches above the surface; but when approaching a vessel to destroy her or engage in blowing up obstructions, only the crown of her deck will be above water. There are but three objects above the decks—viz: pilot-house, smoke-stack and ventilator. These only show a few inches at the most. These articles are perfectly shot-proof, and their openings are protected in the most secure manner.

The novelty of the affair is not seen until a visit is made below the deck. Away aft is placed the engine, with a cylinder of eighteen inches in diameter, and eigteen inches stroke of piston. This engine works a screw of a size capable of forcing the vessel through the water at the rate of say twelve miles per hour. Next comes the boiler which furnishes steam for the main engine as well as for the auxiliary engines, which work the submerging pumps, and the mechanism by which the torpedo arm places the torpedo beneath the ship. Everything connected with these machines is of the most simple and durable kind, and not at all liable to get out of order. Forward of the boiler is the steering wheel, located beneath the pilot-house, and then comes the torpedo machine. It must not be expected of us to explain in detail how this machine works.

Important Letter from General Grant.

While a portion of our citizens at home are endeavoring to create a division in favor of the rebels by sowing the seeds of disunion among us, that right arm of the nation—General Grant—in the midst of his arduous labors writes an able and inspiriting letter which every one should read. The last hope of the secesh is to hold out until the election trusting, as the General says, that something will "turn up."

HEADQUARTERS, ARMIES OF THE UNITED STATES,
City Point, Va., Aug. 10, 1864.

HON. E. B. WASHBURNE:—

Dear Sir,—I state to all the citizens who visit me, that all we want now, to insure an early restoration of the Union, is a determined unity of sentiment North. The rebels have now in their ranks their last man. The little boys and old men are guarding prisoners, guarding railroad bridges, and forming a good part of their garrisons for entrenched positions. Any man lost by them cannot be replaced. They have robbed the cradle and the grave equally to get their present force.

Besides what they lose in frequent skirmishes and battles, they are now losing, from desertion and other causes, at least one regiment per day. With this drain upon them the end is not far distant, if we will only be true to ourselves.

Their only hope now is in a divided North. This might give them reinforcements from Tennessee, Kentucky, Maryland and Missouri, while it would weaken us. With the draft quietly enforced the enemy would become despondent and would make but little resistance.

I have no doubt but the enemy are exceedingly anxious to hold out until after the Presidential election. They hope a counter revolution, they hope the election of the peace candidate; in fact, like Micawber, they are hoping for something to "turn up."

Our peace friends, if they expect peace from separation, are much mistaken. It would but be the beginning of war, with thousands of Northern men joining the South because of our disgrace in allowing separation. To have "peace on any terms," the South would demand the restoration of their slaves already freed. They would demand indemnity for losses sustained, and they would demand a treaty which would make the North slave-hunters for the South. They would demand pay for the restoration of every slave escaping to the North.

Yours truly, U. S. GRANT.

The 600-Pounder.

The *Mechanics' Magazine*, London, never fails to prick any mechanical bubble that looks unsound. The new 600-pounder gun is perhaps not a bubble in any sense, but the article subjoined shows that the conductors of the journal alluded to regard it with suspicion:—

"Day by day new facts leak out to prove that the 600-pounder is by no means worthy of the laudation which it has received in certain quarters. The truth is, that the gun is so wanting in precision that it has little in common with a true rifle. The experiments at the 'Warrior' floating target proved that, out of five rounds with shell, fired at only 500 yards range, but one hit could be obtained, and even that followed on a ricochet. A good deal of privacy has been observed in conducting the experiments; but facts are very troublesome things, and possess a strange faculty for finding their way to the ears of the public. The 600-pounder is a gun capable of burning charges of 70 lbs. of powder, and so far it is a very good gun, but no further. We have already alluded to its want of accuracy, and the following data will show that matters are in this respect worse rather than better than we said. The result of a large number of experiments may be stated thus:—

"At two degrees elevation the common shell (blind) attained a maximum range of 921 and a minimum of 818 yards, the least deflection being 7·2 yards, the higest 8·8 yards. The real difference in range thus amounted to 103 on an average of 870 yards. At three degrees the same shell attained a maximum of 1,244 yards, and a minimum of 1,090, the greatest lateral deflection being 13·8, the least 6·4 yards. The real difference in this case rose to 154 on an average range of 1,167 yards, or between one-seventh and one-eighth of the latter.

"Nor is the aspect of things changed materially by using the very short 512 pound solid shot. In fact, the highest and lowest ranges made at three degrees elevation were respectively as 1,662 and 1,480 yards, giving a plain difference of 182 yards, between the two. Out of ten successive shots fired for this purpose only two were in line, the extreme deflections being to the right 2·2, and to the left 8·2 yards.

"It has been stated that a vote has been taken for the construction of four more of these guns, but this is simply a mistake. Four 600-pounders have been ordered, it is true, but they will not be similar to 'Big Will.' The bore will be but 13 inches instead of 13·3, and we believe that the barrels will not be of wrought iron, but of steel. The order, too, will in all likelihood be executed partly at Woolwich, and partly at Elswick. The report of the select committee is, we have every reason to believe, unfavorable to the gun."

Telegraph Across British North America.

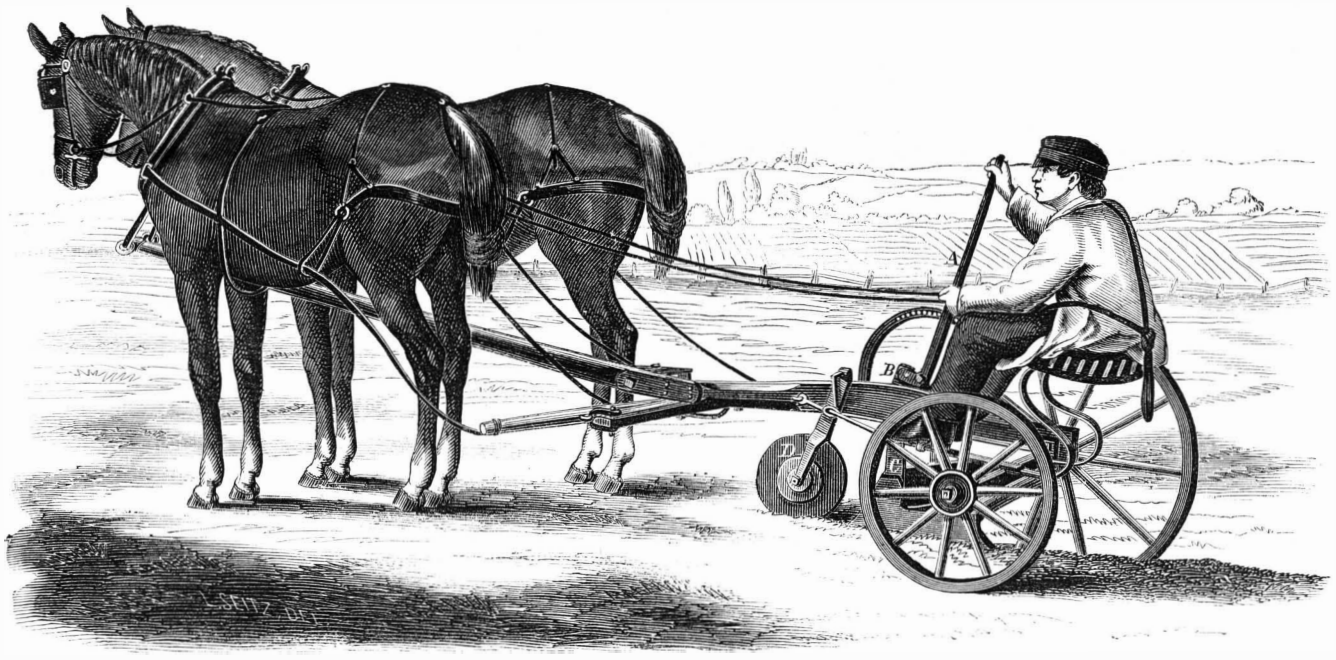
The Montreal *Gazette* says:—"The Hudson's Bay Company lately appointed the Arctic explorer, Dr. Rae, to visit the country between Red River and the Pacific coast, to select the propor line for the telegraph. That gentleman reached Fort Garry about a month ago, and is now far on his way across the plains of Saskatchawan; and we are now enabled to make the further announcement that seventy-seven tuns of the wire, nearly half the quantity required, have arrived in Montreal, and the balance will be here very shortly. The wire is to be forwarded at once by the Grand Trunk Railway Company to Sarnia, and by steamboat to the head of Lake Superior, whence it will be transported during the next winter to Fort Garry or the Red River, at which place the whole of the wire instruments, insulators, etc., will be collected by the beginning of spring. The poles will be got ready during the winter; as soon as the fine weather of next spring sets in, active operations will be commenced, and by the close of the year 1865 there is every reason to expect that telegraphic communication will be in operation from Fort Garry to the shores of the Pacific. The telegraphic system of the United States is now in operation to within about 400 miles of Fort Garry. This gap will certainly be at once filled, and the messages can pass from any part of Canada to British Columbia. Will not Canada be prepared to complete the communication between Fort Garry and Montreal by the Ottawa Valley, so as to have an unbroken line of telegraph stretching from the Atlantic to the Pacific through British territory? This active prosecution of the Pacific telegraph by the Hudson's Bay Company is the best evidence of their intention to inaugurate a new policy in their affairs. The progress of the telegraph with the company's posts every forty or fifty miles will be the surest means of opening up the country, and directing to the fertile territories of the Saskatchawan, the Assiniboine, and the Red River, a tide of settlement and population which will ultimately complete the chain of British colonies from one ocean to the other."

PRIZE TO MR. SOREL.—The prize founded by the Marquis d'Argenteuil for the most useful discovery for the perfecting of French industry, has been awarded to Mr. Sorel, the inventor of the process of the "zincage of iron," known under the name of *galvanizing iron*.—*Les Mondes*,

© 1864 SCIENTIFIC AMERICAN, INC.

Adjustable Sulky Plow.

This plow is novel in its design and construction and is intended to reduce the fatigue attending the performance of this portion of farm labor. It will be seen that the plowman rides instead of walks, and guides the plow by the team instead of tugging at the handles as usual. When an obstruction is found in the path of the furrow, the plow itself is easily and quickly elevated by the lever, A, at the right of the plowman. This lever has a short toe, B, at one end which connects to the plow by means of the bar, C, so that by working the lever the depth of cultivation can be fixed or the plow raised entirely, to avoid stones, etc. A rotary coulter, D, is attached to the plow beam, which turns as the team advances and makes a clean incision with much less friction than the ordinary coulter. The inventor claims for this plow that while it is quite as efficient as any other it is much easier to operate, and that a lame or otherwise infirm person can do a good day's work with it. The off-wheel runs in the furrow and is made slightly larger on that account. A patent for this plow was obtained on the 15th of September, 1858, through the Scientific American Patent Agency, by B. B. Scofield. For further information address Charles Foster, Box 260, Rockford, Ill.

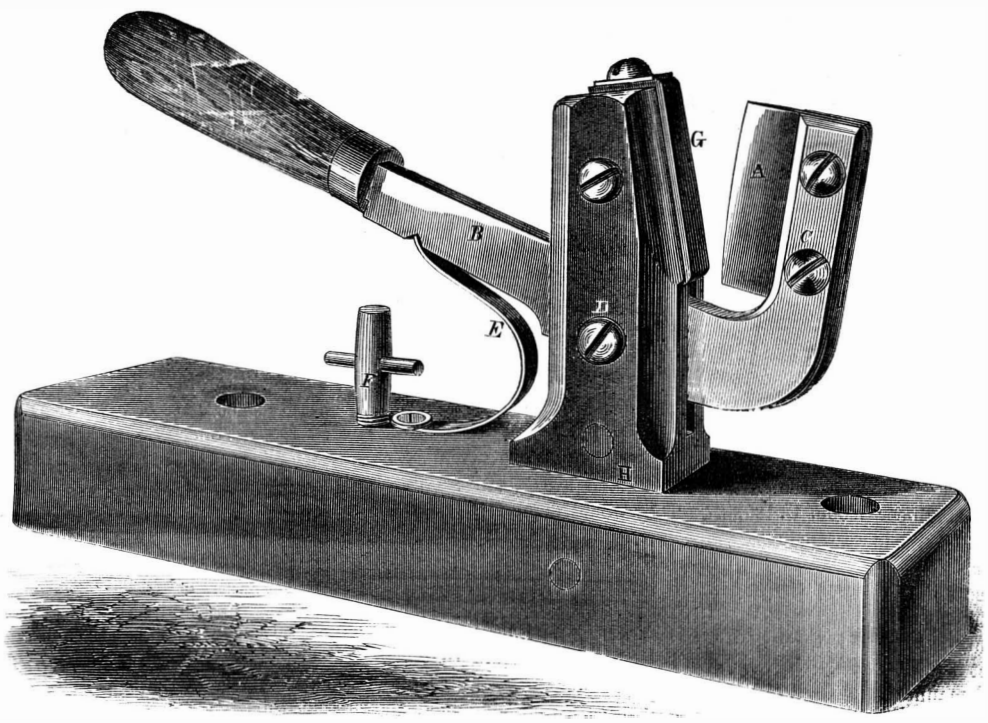


SCOFIELD'S ADJUSTABLE SULKY PLOW.

Grafting Knife.

This instrument is intended for preparing grafts or tree-cuttings for nurserymen and gardeners. It is so arranged as to attain the object without injuring or bruising the grafts or destroying their vitality. The mechanical construction of the several parts is such that they are easily kept in order and are always efficient. The instrument consists of a knife blade, A, set in the lever, B. This blade is independent and is kept in place by the screws; when these are slacked off the knife can be taken out and sharpened. The lever has a handle at one end and works on a center at D; there is also a spring, E, on the under side, and a screw stop, F, which can be raised or lowered to adjust the cut of the blade. At G a leather pad is placed which the knife edge works on and thus preserves its edge unimpaired. The upper part of the standard, H, is sloped off, and the knife works against it in a corresponding manner. By reason of this the operator is enabled to adjust the "cutting" properly between the pad and knife, and also make a smooth, clean incision. Any lateral or side play of the knife is avoided by screwing up the standard, H, at its sides as they wear.

This instrument may be worked either by hand or foot-power, and a patent is ordered to issue through the Scientific American Patent Agency to S. S. Jackson, of Cincinnati, Ohio.



JACKSON'S GRAFTING KNIFE.

For further information address the inventor as above.

A Perpetual Motion Swindler Detected.

The Stanstead (L. C.) *Journal* says:—"Our readers will recollect some notice taken in these columns about a year since of a small machine exhibited through the country, which its inventor claimed to contain the principle of self-motion, or perpetual movement. The machine was a metallic wheel with a system of cords and falling balls suspended to the arms of the wheel, which was supported on a thick base of wood. It turns out that the affair is a very ingenious deception. The base or platform contains a system of clock-work, with a spring running up to the axis through one of the standards supporting the wheel. When 'wound up,' it would run some twelve hours. The inventor of this wonderful 'perpetual motion' is said to have made quite a sum by humbugging persons, and then imparting the secret. Of course parties who have invested are anxious to get their money back by sale or exhibition, and have had a motive in keeping his secret."

[There is no "principle of perpetual motion," and it is a waste of time and money to look for it.—Eds.

Lighting Mines.

The London *Mining Journal* says the Rev. W. R Bowditch, of Wakefield, England, proposes to condense air by a pump, or other suitable means, and convey it in pipes to a receiver, and thence to the light, to be supplied, or directly from the condenser to the light. The light, naked or in a safety-lamp, is placed in a lantern, which has an aperture for the admission of the pure air, and one or more apertures for the exit of the air and products of combustion. The condensed air is conducted through a pipe, which fits tightly into the lantern, and by this air combustion is supported. The surplus air, and the products of combustion pass out through the apertures made for that purpose in the lantern. The air being supplied to the lantern under pressure, prevents the entry of firedamp or any other dangerous gas that may surround the lantern. Air under pressure is apt to extinguish lights supplied with it, and to flow to waste if the current be not regulated; to prevent this he passes it through a pipe or pipes, obstructed by screw-plugs, or taps, or wire, or by combinations of these, or by other suitable impediments, so that its flow may be regulated according to the supply needed. He also uses the waste air blown off from engines worked by compressed air. In this case, the air which is blown off is received into a suitable box, with a valve, before it is allowed to mingle with the atmosphere, and it is conducted from the box to the light through a pipe or pipes, as described. He also allows the air to escape around lights without its closing them, but this plan is not so efficient, and has the additional disadvantage of being much more expensive, two important drawbacks to its adoption.

© 1864 SCIENTIFIC AMERICAN, INC.

THE

Scientific American.

MUNN & COMPANY, Editors & Proprietors.

PUBLISHED WEEKLY AT

NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

☞ Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.

VOL. XI. NO. 12....[NEW SERIES.]....*Twentieth Year.*

NEW YORK, SATURDAY, SEPTEMBER 17, 1864.

Contents:

(Illustrations are indicated by an asterisk.)

*Stewart's Sorghum Evaporator	177	Important Letter from Gen. Grant	183
Recent American Patents	178	The 600-pounder	183
Miscellaneous Summary	179	Telegraph across British North America	183
A New Alloy for Bells	179	*Scofield's Adjustable Plow	184
Some Facts about Diamonds	180	*Jackson's Grafting Knife	184
*Huntington's Self-acting Safety-valve	180	Lighting Mines	184
The Calorimeter of Boilers	180	The English going ahead of us in Arms	185
The Iron Business of Lake Superior	181	The Mission of Machinery	185
What 15-inch Shot Do	181	Gas Engines	185
Dust on Railroads	181	Concussion of Heavy Guns	185
Cast Cast-steel Car Wheels	181	The First Fall Meeting of the Polytechnic	185
Concerning Twin Screws	182	Agricultural Department of the Patent Office	185
Aerial Navigation	182	Patent Claims	186, 187, 188, 189, 190, 191
High and Low Velocities	182	*Leslie's Steam Boiler	192
A Whitewash that will keep	182	Zinc for Coinage	192
1,000-pounder Cannon	182		
A Singular Steam Engine	183		
A New Submarine Boat	183		

THE ENGLISH GOING AHEAD OF US IN ARMS.

It is stated in some of the papers that orders have been issued for arming the whole of the British infantry with breech-loading rifles. Experience in our war has shown that this would be equivalent to increasing their numbers at least five fold. We have been accustomed to consider the English Government as very conservative of old methods, and slow in adopting improvements, but if the above statement is correct, it would seem that they are more prompt to profit by our experience than we are ourselves.

In heavy ordnance too, the British Government is making gigantic strides. The strange favoritism shown to the absurd breech-loading system of Sir William Armstrong, so fondly supported by the leading daily press, has been shaken by the intelligent criticisms of the *Mechanics' Magazine*, and *Engineer*, and is now being overthrown by the results of extensive trials. The English are not following our practice at all in heavy cast-iron ordnance, their heaviest guns of this material being of 8-inch caliber, while we have them in use of 9, 10, 11, 13, 15 and 20-inch caliber. In England the attention of the Government and manufacturers seems to be directed wholly to the use of wrought iron or steel, or to combinations of these two materials for the construction of heavy ordnance. The largest gun yet made of wrought iron is 13⅓ inches caliber, and weighs 22 tons. This is the gun that Sir William Armstrong chooses to call the 600-pounder, we suppose on the ground that a bolt might be put into it of sufficient length to weigh 600 pounds. It is rifled but with a turn of only 1 in 56, and it is found that this is not sufficient to prevent an elongated bolt from tumbling over. Its most destructive effects have been produced by a shell nearly spherical, weighing 303 pounds, and discharged by 40 pounds of powder.

But the delusions in regard to Sir William's humbugs, though supported by the most powerful of the daily press, are being rapidly brushed away by the costly lessons of experience, and the enlightened discussions of the mechanical journals. The best form and material for heavy ordinance will doubtless be arrived at, and then the enormous appliances of the English workshops will enable them to turn out cannon equal in quality to any that can be made in the world.

The strange supremacy which this conntry has so long enjoyed in ordnance, was doubtless owing to the contempt in which our naval and military establishments were held by the fighting monarchies of Europe. This contempt is now in a measure removed, and our advance will be watched with jealousy by all military powers. England, France, Prussia and other nations are constructing heavy ordnance of wrought iron and steel, and we shall need all of our skill and energy to keep pace with them. England is even taking a stride far in advance of us in infantry arms, an advance that will render 50,000 of her troops equal to 200,000 of ours in any engagement. We trust that our Government will allow no other nation to get the advantage of us in the all important matter of arms.

THE MISSION OF MACHINERY.

When Charles Dickens wrote "Bleak House" he created a prominent character—Mrs. Jellaby. This lady had a mission. She was obliged to look after the heathen, and she looked after them so fast and so far that her own children were in rags and tatters; her house was a scene of disorder, her daughter ignorant and stupid, her husband a nonentity, prone to sit by the kitchen stove, and the whole domestic machinery was disordered and deranged. This was simply the natural result of neglecting her duty; but if the same distinguished author should revisit this country and write about ladies with missions, he would find a very different state of things to chronicle.

Look at what the simple machinery of the household has done for society. Years ago the housewife sat of an evening and plied her needle when the heavier labors of the day were done. The garments that rose before her aching sight threatened to overwhelm her, and as for the stockings—there were dozens of them. It is not so now; and we may thank inventors that in their tireless perseverance they have provided the machines to do the drudgery of the needle. In an hour a machine can do more than the hand in a day, and the matron rests instead of working. It is not in the sewing machine alone that we find great social changes, but also in the kitchen, laundry, and even in the nursery. With wringing and washing machines the laundress can do her work in half the time formerly required, with mangling machines the labor of ironing is greatly reduced. The nurse's task is lightened by many ingenious toys. The walking dolls, self-acting locomotives, velocipedes, cantering horses, baby-jumpers, and wooden dancing negroes, have all been originated from the fertile fancies of inventors, and it is hard to think of any condition of society, high or low, which has not been almost revolutionized by the introduction of machinery either directly or indirectly.

This is always the mission of machinery—to lessen the labor of mankind, to make it better, for where drudgery is dispensed with, man rises elastic, as grass does after the feet have passed over it. Every useful machine invented is another step forward in the progress of civilization, and the thrift, energy, and affluence of any community is directly in proportion to its labor-saving machinery.

GAS ENGINES.

When a person in any town or city makes a successful invention the minds of his fellow citizens are naturally turned in the same direction, and they are very apt to produce a series of inventions in the same department of the arts. The success of Lenoir's gas engine has fired the imaginations of the Parisians, and they are patenting a number of gas *moteurs*. The London *Mining Gazette* gives the following description of one of these inventions:—

"An improved 'gazomoteur,' the invention of Mr. Belon, has been successfully introduced at the paper factory of Mr. Anzin, near Paris, and has been favorably reported upon by the Academy of Sciences. It is stated that the machine possesses an economy equal to 60 or 70 per cent; it consists of three principal parts—an air-pump, a smoke-consuming furnace, and a motive cylinder. The furnace, when the engine is at work, remains closed, except at the orifice by which the air-pump opens on it, and the one by which the heated air sets the cylinder in motion. It is so arranged that a quantity of combustible matter, equal to that which it consumes, falls constantly into it. A state of combustion is kept up by the air-pump: part of the air passing from this rushes into the furnace; the rest combines with the coal gas, forming thus a gaseous mixture, the volume of which is far greater than that of the air previous to its introduction to the furnace. This mixed air acts on the piston of the *cylindre moteur* with a force proportionate to the increased volume produced by the elevation of the temperature."

If any of our readers ask what is meant by "an economy equal to 60 or 70 per cent," we can only say that the phrase is as unintelligible to us as to them.

It will be seen that this *moteur* is simply the steam engine worked by gas. The gas and air are forced into a tight chamber corresponding to a boiler, where they are burned, and the products of combustion are then worked through a cylinder. It is what Mr. Fairbairn would call a gas engine of constant pressure.

This engine is the same in principle as Roper's air engine, but must be far more expensive both to construct and to operate. Roper uses for fuel anthracite coal, a day's supply of which is placed in the chamber in the morning; while in the case of the gas engine a pump must be constructed to force the gas into the chamber as it is consumed. Anthracite coal costs now about half a cent per pound, and illuminating gas about 5½ cents, ten times as much.

CONCUSSION OF HEAVY GUNS.

Every country boy who has ever been to a "general training," as the annual muster of village militia is called, has remarked how the grass is blown down by the discharge of the 6-pounder gun usually fired on such occasions. Similar effects take place every time a gun is fired, but they are not always so apparent. The discharge puts a column of air in motion from the muzzle outward, which sweeps forward with terrible force. The original *Monitor*, when she engaged the *Merrimac* in Hampton Roads, was universally condemned for not following the repulsed vessel to its lair, and the correct reason for her failure to do so has never been given until the publication of this article.

The *Monitor* did not follow the *Merrimac* because she was not in a condition to do so, for this reason:—The pilot-house, it will be remembered, was immediately forward, and when the guns were fired in line with the keel the shot passed over it.

The top of the pilot-house was a solid, wrought-iron plate, 3 feet 6 inches wide, by 5 feet long, and 3 inches thick. This top was lifted bodily up and displaced by the discharge of the 11-inch guns fired from the *Monitor's* turrets, so that in sheering off to repair this damage the *Monitor* reluctantly allowed the rebel vessel to escape.

The guns could not afterwards be fired except at an angle of 30° with the keel, so great was the effect of the discharge upon the vessel itself, and upon the inmates of the pilot-house through the sight holes. For this reason, and some others, the pilot-houses on the new monitors are placed over the turrets, and the hatches which cover the openings in the deck are all strongly fastened with heavy bolts.

FIRST FALL MEETING OF THE POLYTECHNIC.

The Polytechnic Association of the American Institute held its first regular meeting after the summer vacation at its room at the Cooper Institute, on Thursday evening, Sept. 8th, the President, D. S. Tillman, in the chair.

The President read an address, giving an account of the progress of internal improvements in the country from their commencement, and the remainder of the evening was devoted to miscellaneous matters. Petroleum was selected as the subject for the next evening, it being understood that Mr. Overton, who has been spending some time in the oil region, will open the discussion.

Agricultural Department of the Patent Office.

The examination of the class of cases in the Agricultural Department of the Patent Office has been much behind along back, owing to the resignation some time ago of the Acting Examiner-in-Chief, Mr. Dodge. We are happy to learn that the examining force in this room has been re-enforced by the appointment of Prof. A. G. Wilkinson, an energetic, talented gentleman, who will be sure to give this important department of the Patent Office renewed vitality.

BRITISH RAILROADS.—There are now in the British Islands three hundred and seventy-five district railway companies, who own eleven thousand five hundred miles of road. They carry above eighty million passengers yearly, and above thirty million tuns of merchandise and minerals. They give employment to probably not less than two hundred thousand persons.

© 1864 SCIENTIFIC AMERICAN, INC.

ISSUED FROM THE UNITED STATES PATENT-OFFICE
FOR THE WEEK ENDING AUGUST 30, 1864.
Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

43,961.—Flyer for Spinning Frames.—John H. Aldrich & S. L. Pattee, Northbridge, Mass.:

We claim a flyer for fly-frames or other frames, in which the flyer is removed in doffing, having a curved passage for the roving, distinct from the socket, essentially as above described.

43,962.—Treating Moss for Mattrasses, etc.—Charles G. Angeroth, Philadelphia, Pa.:

I claim treating moss with alum, as set forth for the purpose specified.

43,963.—Sewing Machine.—J. W. Arnold & H. W. Couch, West Macedon, N. Y.:

We claim the vertically adjustable gate, D, wtih its slide, b, in combination with the saw, E, pitman, C, and driving wheel, B, in such a manner that when sawed away from the log, the saw may run on a line toward the axis of the driving wheel, but when lowered it may produce a slight rocking motion to clear the kerf, substantially as herein set forth.

In combination with the gate, D, saw, E, and driving wheel, B, we also claim the arm, I, and bar, H, the latter provided with the support, h, or equivalent, the whole arranged substantially in the manner and for the purpose herein specified.

We also claim the arrangement of the gate, D, ways, G G, arm, I, and bar, H, saw, E, hinged guide, M, and pressure slide, L, substantially as and for the purpose herein set forth.

43,964.—Machine for loading Hay.—John B. Atwater, Chicago, Ill.:

I claim the combination of the plates, n r, concave teeth, p, spring, s, with the bands, e e, of a hay-raking and loading apparatus, substantially in the manner and for the purpose described.

43,965.—Frying Pan and Kettle.—Cyrus Avery, Ashtabula, Ohio:

I claim the adjustable catch, E, or its equivalent, in combination with the handle and pan, for the purpose specified.

43,966.—Water Elevator.—H. J. Bailey & S. S. Williams, Pittsburg, Pa.:

We claim, first, The bars, e e, pivoted at their upper ends to the sides of the curb, A, and connected at their lower end by the rod g in connection with the roller, I, or its equivalent, all arranged to operate in the manner substantially as and for the purpose herein set forth.

Second, The pawl, M, provided with or attached to the rod, j, and balanced on the pivot, l, in connection with the ratchet, D, all arranged to operate in the manner substantially as and for the purpose herein set forth.

43,967.—Water-back for Ranges.—Thomas Bradford, Boston, Mass.:

I claim the combination of the water-back, C, the end water-chambers, a a, supply pipe, D, discharge pipe, D′, and open front grate, B′, all constructed, arranged and employed, as and for the purposes herein specified.

[This invention consists in having the water back extend around he ends of the fire chamber or grate, whereby a greater heating surface than usual is not only obtained, but the usual end linings of the fire-chamber or grate dispensed with.]

43,968.—Corn Planter.—John H. Broad, Lodi, N. Y.:

I claim, first, Giving an intermittent rotary motion to both the seed cup drums, a a, and the agitators, g′ g′, by means of ratchet wheels and pawls. g g h h, rock-shaft, k, and a spurred hub, operating upon a dog, m, all arranged and operating substantially as described.

Second, The combination of the spurred hub dog, m, and toothed plate, n, with the rocking pawl shaft, k, and seeding mechanism, substantially as described.

Third, The catch-plate, s, and lever-arm, l, in combination with the rock shaft, k, substantially as and for the purposes described.

43,969.—Car Coupling.—Wm. C. Bussey, Jackson, Cal.:

I claim the eccentric hook wheel, B, in connection with the lever, D, plate, E, and trigger, F, all arranged to operate with the shackle or link, G, in the manner substantially as and for the purpose herein set forth.

I further claim the spring clamp composed of the spring, H, and pendants, l, one or more, substantially as and for the purpose specified.

43,970.—Composition for Luting Gas Retorts.—John Chilcott. Brooklyn, N. Y. Ante-dated Aug. 24, 1864:

I claim the addition to the loam, clay, or lime luting used for luting gas or other retorts, or other purposes of fresh clay and graphite, either with or without a small quantity of lime, whereby it is rendered capable of being used repeatedly, substantially as herein specified.

43,971.—Threshing Machine.—L. N. Clark, Brighton, Mich.:

I claim making the carrier frame of three or more sections, and hinging them together as described, and attaching the lower section to the threshing machine, in the manner described, in combination with the ropes, D, and windlass, E, when these several parts are constructed, arranged and combined as and for the purpose herein set forth.

43,972.—Baby-jumper and Walker.—John H. Coldwell, New York City:

I claim the base, A, provided with the socket, B, in combination with the seat bar, C, and spring, D, all being arranged to operate substantially as and for the purpose set forth.

[This invention consists in attaching a seat to a curved bar which is secured by a pivot in a socket attached to a base or support, the seat-bar having a spring connected to it and all arranged in such a manner that a very portable baby-jumper is obtained, and one which may with the greatest facility be converted into a baby-walker when required.]

43,973.—Apple Bin.—Samuel S. Cole & Gideon W. Cole, Canton, Ill.:

We claim, first, The principle and process of ventillating and freezing a bin or bulk of apples, substantially as set forth, for the purpose of preserving their flavor and preventing their decay until late in the ensuing summer.

Second, The method and means substantially as set forth, of so constructing a bin as to control the ventilation and freezing of apples, for the purpose herein set forth.

43,974.—Fruit Basket.—Charles Crozat Converse, Dubuque, Iowa:

I claim, first, The construction of a fruit basket out of a single blank of any suitable material, in the manner and for the purpose substantially as described.

Second, Forming a fruit basket out of a single blank, so as to give the center of its bottom a conical shape, substantially as described.

[The advantages of this basket are extraordinary cheapness (so that the fruit or berry grower can afford to let it go with the fruits or berries), great strength, and perfect ventilation along its sides and bottom.]

43,975.—Pump Pipe.—John P. Cowing, Seneca Falls, N. Y.:

I claim a pump pipe coupled together and otherwise constructed as described, as an article of manufacture.

43,976.—Hydro-atmospheric Condenser.—Jean Paire Florimond Datichy, New York City. Patented in England Feb. 23. 1864:

I claim, first, The application of water or air, separate or together so as to condense the exhaust steam of an engine, and return the same to the boiler by the means and devices herein described.

Second, I also claim a ventilator or blower at top, so arranged as to conduct the air around the pipes conducting the water into the air chamber of the condenser, as herein described and for the purposes set forth.

Third, I also claim the air chamber or column, U, having four valves, independent of the valves of an ordinary pump, two of them above and two below, the upper ones working in opposite directions to the lower ones, so as to pump and discharge the air alternately, according to the escape of any air, as herein described.

Fourth, I also claim the arrangement and construction of the double condenser with its center pipe and tubes surrounding it, in combination with its wire gauze top, and chamber underneath, for the purposes specified.

43,977.—Horse Shoe Machine.—S. W. Davis, Wilmington, Del.:

I claim, first, The adjustable rollers, e in combination with the reciprocating slide, C, its curved slot and the crank pin by which the said slide is operated.

Second, The shaft, I, with its cam, J and J′, the sliding frame which carries the indenting die and the spring, t, or its equivalent, whereby a backward movement may be imparted to the said die independent of that derived from the action of the cam, J′, as herein set forth.

43,978.—Plow.—John Dement, Dixon, Ill.:

I claim the standard, A, the brace, B, with connecting braces, g1 and g2, and rod, m, the whole constructed and arranged in the manner and for the purpose substantially as herein set forth.

43,979.—Molding of Metal.—August Destouy, New York City:

I claim, first, The use of T-shaped metal moldings, made substantially as and for the purpose specified.

Second, The jaws, B or D D, either straight or curved, and tool, C, constructed and operating substantially as herein set forth for the purpose of imparting to the moldings the final touch before they are applied to the article to be ornamented.

[This invention consists in the employment or use of metal moldings made of thin sheet metal, bent to the form of a T, in combination with doors, windows, furniture of any kind, picture frames, etc., in such a manner that by means of a thin vertical shank said T-shaped moldings can be readily inserted into the articles to be ornamented, and if the moldings are bent and their ends fastened together by soldering they can be used in picture frames to protect the inner edge, to retain the glass and the picture and to form an ornament.]

43,980.—Horse Rake.—S. Eberly, Mechanicsburg, Pa.:

I claim the bar, F, provided with holes, c, for the rake teeth, F, to pass through, and connected by arms, d, to the shaft, D, on which the bars, d, in the rake teeth are fitted or placed loosely, in combination with the bar, G, provided with the weight or counterpoise, H, the upright lever, I, and foot lever, K, all arranged and applied to operate substantially in the manner as set forth.

[This invention relates to a new and improved horse rake of that class in which wire teeth are used, and it consists in an improved mode of operating the rake, that is to say raising and lowering it so that it may discharge its load and keeping it in proper position while performing its work.]

43,981.—Metallic Shirt Collar.—Otto Ernst, New York City:

I claim a metallic shirt collar formed in the manner specified to retain the button by the introduction of the part, d, behind the button in the act of clasping the ends of the collar together, as set forth.

43,982.—Washing Machine.—Thomas R. Ferris, Monroe, Mich.:

I claim the spirally fleeted cylinder, B, in combination with the endless apron, C, and concave, G, arranged to operate substantially as and for the purpose set forth.

I also claim operating the endless apron, C, through the medium of the ratchet, H, and the pawl, I, the latter being attached to the swinging bar, J, operated by a spring, h, and a cam, K, on the shaft of cylinder, B, substantially as described.

I further claim in combination with the cylinder, B, and the endless apron, C, the supplemental roller, L, arranged and applied substantially as and for the purpose specified.

[This invention consists in the employment or use of a spirally-fluted cylinder, an endless apron, and concave, and also in the employment or use of a supplemental pressure roller, all arranged and combined in such a manner that clothes may be washed without injury and at the same time subjected to a requisite degree of pressure and friction to ensure the work being done thoroughly, and with a very moderate expenditure of labor and time.]

43,983.—Process for Amalgamating Ores of Silver.—W. R. Frink, Virginia, Nevada Territory:

I claim the use of finely pulverized or precipitated metallic copper in combination with or without the sulphate of iron or other material used in precipitating, applied in the manner substantially as herein specified for the purpose of facilitating the process of amalgamating silver with the least possible loss of quicksilver.

[This invention consists in the application or use in amalgamating silver ores of metallic copper precipitated from the sulphate of copper by the addition of iron finely divided by any suitable means in such a manner that the chloride of silver is readily reduced to the metallic state, and the silver is thereby predisposed to amalgamate at the expense of copper instead of the quicksilver and a large amount of quicksilver can thereby be saved.]

43,984.—Oil Cup on Smoking Pipe.—John G. Gehring, Baltimore, Md.:

I claim the combination of the lever, E′, spring, e′, and cup, E, with the chamber, D, and apertures, a a′, substantially as and for the purposes herein specified.

43,985.—Machine for making Heads to Barrels.—Edmund Greenlee, Summerhill, Pa. Ante-dated Aug. 1, 1864:

I claim the tool, N, when constructed, arranged, and operating in the manner described, for the purpose set forth.

43,986.—Horse-holder.—Sam Hague, Utica, N. Y.:

I claim, first, A horse-holder consisting of a standard so applied to the axle of a wagon or other vehicle, and capable of being so geared with one of the wheels thereof, that when the reins are hitched to it, the starting of the horse or team, will instantly produce such a movement of the said standard, as to draw in the reins, substantially as herein specified.

Second, The combination of the jointed standard, A C, sliding rod, l, toothed sector, G, plate, F, roller, h, springs, g and j, and toothed ring, D, the whole applied in combination with each other, and with the axle and wheel of a wagon, or other vehicle, to operate substantially as and for the purpose herein specified.

43,987.—Machine for Stretching Chains.—Charles Hall, New York City:

I claim, first, The employment or use of the two pairs of tongs, D E, or other suitable clamps in connection with the screw, H, or its equivalent, arranged substantially as and for the purpose specified.

Second, The chain, F, or its equivalent, in connection with the swivel, G, for conveniently connecting the tongs, E, to the screw, H, as set forth.

Third, The gage, C, when used in combination with the tongs, D E, and screw, H, or its equivalent for the purpose specified.

[This invention relates to a new and useful device for stretching chains, those which are designed for working over pulleys, whereby the links are all brought to an uniform length, so that they will all engage with the teeth on the pulleys or fit properly or snugly in recesses made therein.]

43,988.—Hay and Straw Cutter.—Thomas Hazard, Wilmington, Ohio:

I claim, first, Operating the endless feed-apron, B, through the medium of the ratchet, D, attached to the shaft of the front roller, b, of said apron, and a slide, E, having a pawl, D′, attached to it, together with a wheel, F, provided at its periphery with a cam-shaped projection, k, all arranged to operate substantially in the manner as and for the purpose set forth.

Second, Raising the press-board, L, through the medium of the knife, J, the latter as it is raised striking against the rod, P, substantially as described.

[This invention relates to a new and improved fodder-cutting machine of that class in which a reciprocating knife is employed, and the invention consists in a novel means for operating an endless apron by which the substance to be cut is fed to the knife and also in a novel means for operating the press-board which holds or clamps the substance to be cut while the knife is acting upon it; all being arranged in such a manner that a very simple and efficient device is obtained for the desired purpose, and one which may be operated equally well by manual or other power.]

43,989.—Mode of cutting Envelopes from Sheets of Paper.—James P. Herron, Washington, D. C.:

I claim the cutting of the paper or other material for envelopes, economically in the form, substantially as represented.

43,990.—Apple-parer.—S. S. Hersey, Farmington, Me.:

I claim, first, An apple-paring machine having its knife bar arranged and operated so as to move or describe a semi-circle, and pare the apple while moving in the lower part of the semi-circle in either direction, and the knife be thrown out from the apple while the knife bar is moving in the upper part of the semi-circle, substantially as set forth.

Second, The swinging or oscillating frame, M, clutch, L, and whee's, K K′, in connection with the knife bar, O, attached to the frame, M, and provided with a spring and arranged with a projection, i, to operate with a stationary cam on the bar, I′, of the frame, A, or other equivalent device for throwing out the knife from the apple, substantially as described.

[This invention consists in a novel manner of operating the cutter whereby the same is made to act upon the apple while moving in both directions, that is to say, while passing from the butt to the point of the fork, and vice-versa, due time being allowed for the removal of a pared apple from the fork and the placing of an unpared one upon it under a continuous motion of the driving wheel of the machine.]

43,991.—Cart.—H. Holcroft & C. S. Smith, Media, Pa.:

I claim the slotted cars, c, in combination with the box, A, thills, D, and brake, E, constructed and operating substantially as and for the purpose herein shown and described.

43,992.—Drum Stove.—Isaac L. Holmes, Haydenville, Mass. Ante-dated Aug. 27, 1864:

I claim two conical chambers, A A, connected by a series of tubes or pipes, B, with a damper, C, in the upper chamber, A, and the spark arrester, D, in the lower chamber, A, all arranged substantially as and for the purpose herein set forth.

43,993.—Percussion Igniter of Time Fuses for Explosive Shells.—B. B. Hotchkiss, Sharon, Conn.:

I claim, first, Enclosing the striker, D, within a thin protecting case, B, and securing the parts, B and D, together, as herein shown so that the striker and its case may be transported and handled with the fulminate between them protected from friction or abrasion, substantially as and for the purposes herein set forth.

Second, I also claim constructing the case of a fuse igniter in two parts, A and B, with the base and sides of each part formed in one piece, and one part fitted within the other, nearly the whole length of each, substantially as and for the purpose above described.

Third, I claim in connection with the above, providing both ends of the device with fulminate, C, so as to adapt it to operate equally well with either end forward, substantially in the manner herein set forth.

43,994.—Handle for Files.—C. F. Hunter, Adrian, Mich. Ante-dated Aug. 16, 1864:

I claim a file handle constructed as above described with its clamps, B B, bolt, C, bolt, E and handle, G, for the purposes set forth and described.

43,995.—Combined Seeder and Cultivator.—Wm. Ironside, Jennerville, Pa.:

I claim, first, The arrangement of a single guide pulley, M, and slotted side supports, L, when combined with the vibrating arms, K, for the covering scrapers, Q, and means of raising them from the ground by a strap, I (and securing them) or its equivalent, substantially in the manner and for the purpose specified.

Second, I claim the construction of the slide, IV. (Fig. IV. No. 2), with the ends on the underside centrally chambered, open on the outer edge, b, operated in a sunken portion, Y, of the centrally open ended bottom with its slot, u, by the combined action of the forked rocker, r, its arms, H, and the connecting rod, G, pinion, F, and spur wheel, E, all operated by the roller, D, when arranged as shown for the purpose specified.

Third, I also claim the loose or false hopper bottom, U, with its upright, x, long slot and central opening, v′, in combination with the brush block, V, all covering the vibrating slide, IV, secured and arranged in the manner specified.

43,996.—Knife for Nurserymen.—S. S. Jackson, Cincinnati, Ohio:

I claim, first, The knife or cutter, C, attached to a curved bar, D, in connection with a standard, B, provided with an oblique or inclined surface, f, and the fulcrum pin, e, on which the knife-bar, D, is fitted, as and for the purpose specified.

Second, The adjustable pin or rod, E, fitted in the bed-piece, A, when used in combination with the knife-bar, D, and standard, B, for the purpose set forth.

Third, Constructing the standard, B, in two parts, a a, connected by screws, b, when said standard thus constructed, is used in combination with the knife-bar, D, as and for the purpose specified.

[This invention relates to a new and improved knife, designed more especially for the use of nurserymen in preparing cuttings for the propagation of plants, and for grafting and other purposes.]

43,997.—Buckle.—George R. Kelsey, West Haven, Conn.:

I claim, as a new article of manufacture, a buckle, when constructed and fitted for use, substantially as herein described.

43,998.—Mode of attaching Pipes to Sinks.—S. C. Ketchum, Winchendon, Mass.:

In combination with the sink bottom, A B, and the pipe, C, of ductile material, I claim the hollow tapering nut, D, threaded on its external surface and fitted and secured into the pipe, C, in the manner and for the purposes shown and described.

[The claim explains the virtue of the invention. By the use of this improvement the connection between sinks and drain pipes may be very quickly made, or if repairs are necessary, a separation may be as easily effected.]

© 1864 SCIENTIFIC AMERICAN, INC.

43,999.—Churn.—Patrick Killin, Mt. Healthy, Ohio:

I claim suspending tube, D, funnel shape at its base, upright and parallel from the side of shaft, B, in churn, A, in combination with the spiral perforated breaker, C, substantially as and for the purpose herein set forth.

44,000.—Grinding-mill.—Frederick Klinkerman, Farmer's Retreat, Ind.:

I claim, first, The arrangement of foot beam, D, laterally adjustable pedestal, E, vertically adjustable step, F f, bridge tree, G, and shifting foot or fulcrum, H, for the purpose set forth.

Second, In combination with a vertically and angularly adjustable mill-spindle, I claim the vibratable box, L L′ l l′, ledges, m, shoulders, N, and keys, O, substantially as set forth.

44,001.—Composition for preventing Incrustation in Steam Boilers.—F. Lambrun, New Orleans, La.:

I claim the within-described composition for preventing the incrustation of steam boilers, consisting of the ingredients above specified, and mixed in about the proportion and in the manner herein set forth.

[This invention consists in a composition which, when introduced in a steam boiler, will prevent the formation of scales on the flues or on the inner surface of a steam boiler, and keep the impurities contained in the water in suspense therein, so that they can be blown out with the greatest ease and facility.]

44,002.—Bridle Bit.—A. H. Laugholz, Chicago, Ill. Ante-dated Aug. 15, 1864:

I claim the double round bar bit with its concave and convex projection, H, as described and for the purpose set forth.

I also claim the square slot, G, at the top of the levers, for the purpose set forth.

44,003.—Sewing Machine.—Lebbeus W. Lathrop, Philadelphia, Pa.:

I claim, first, Passing a loop of needle thread over a common store spool, substantially in the manner described, said spool having an oscillating vibratory motion to release and relieve the thread in its passage over it.

Second, I claim attaching a take-up to the spool frame, inside the revolving cup, substantially as and for the purposes specified.

Third, The combination of the stationary and the vibrating spool-frame controllers described, to alternately keep the spool frame from revolving with the cup, without producing friction on the needle-thread.

Fourth, The combination of an upper tension on the needle-bar with a spring tension on the spool-holder, constructed and operating together, substantially as described.

Fifth, Oscillating the spool-holder, substantially in the manner described, to permit the loop of needle thread to pass between the spool-case and the case-holder.

Sixth, The combination of the hollow grooved revolving hook, and the flanged and oscillating spool-holder, constructed and operating together, substantially as described.

Seventh, I claim the bevelled hook described and shown, so long and slender pointed, that the point, after entering the loop, shall not begin to spread it until after the eye of the needle has reached the cloth in its ascent.

44,004.—Machine for stretching and glossing Silk, etc., in the Skein.—Lewis Leigh, Seymour, Conn. Patented in England Sept. 17, 1862:

I claim the revolving sleeves or stretching pins, in combination with the enclosing case, for stretching and glossing skeins or hanks of silk, or other fibrous material, substantially as specified.

44,005.—Lubricator.—Lewis Leigh, Seymour, Conn.:

I claim the combination of the said lubricator with the pipe-shaped globular bolster, c, for the purposes and as specified.

44,006.—Steam Whistle.—Levi E. Lincoln (Elizabeth K. Lincoln, Administratrix), Lowell, Mass.:

I claim, first, The use of radial arms within or without the bell of a steam whistle, by which to retain said bell in the annular steam current.

Second, The use of openings in the discharge chamber of a steam whistle, in addition to the annular opening thereof, to the effect of preventing excessive discharge through said annular opening into, or upon, said whistle's bell.

Third, The use of a steam bell, the edges of whose mouth, sectionally or wholly, are unequally distant from the plane of the whistle's annular opening, to the effect of providing bell surfaces differently attached by the same current.

Fourth. The making of the edges of the mouth of a steam bell, in arcs of unequal radii, to the effect of securing upon said bell, a unitive or an alternate and changing impact.

Fifth, The fitting of the bell of a steam whistle loosely around its supporting or guiding post, in such manner that the said bell may rise perpendicularly, and float above the annular opening of the whistle, in, and by the force of, the steam that attacks it.

Sixth, The combination in a steam whistle of a valve seat and valve, with a bell whose edges of impact are in arcs of unequal radii, or with a bell whose edges, wholly or sectionally, are unequally distant from the plane of the whistle's annular opening, substantially as set forth and described.

44,007.—Lock.—William Lorenz, Lebanon, Pa.:

I claim, first, Constructing the hasp, B′, so that its hinge shall form the notched ring, B, which can be moved only when the tumblers, a a a′, are lifted out of the notches in the ring, B, substantially as set forth.

Second, Constructing one of the tumblers with a knife edge, to be operated by the key, in the manner and for the purpose substantially as set forth.

Third, The spiral spring, F, attached at one end to the case, A, and the other end to the ring, B, operating substantially as described.

44,008.—Safety-guard for Locks.—Orlando Lund, Nashua, N. H.:

I claim my improved construction and application of the safety guard, whereby it, by being raised upward is not only caused to lock the key, by the action of the part, t, thereof, and the bit pass ge of the key-hole of the said guard, but to close the key-hole of the lock or the escutcheon plate thereof, all substantially as specified.

44,009.—Horse Shoe.—James F. Mallett, New York City:

I claim, first, A sectional jointed horse shoe which is so constructed that it can be expanded or contracted in width either at the heel, or at an intermediate point between the heel and toe, or at both of said points at pleasure, substantially as described.

Second, A sectional jointed horse shoe which is constructed with one or both of its heel sections jointed to forward jointed sections, substantially as and for the purposes described.

Third, So constructing the pivot pins of a sectional jointed horse shoe that they constitute a part of the underlapping portions of the sections, substantially as described

Fourth, The use of projections, g g1 g2, applied to a sectional jointed horse shoe in such manner as to strengthen the sections at the joints, and to constitute calks for preventing the horse from slipping, substantially as herein described.

44,010.—Hydraulic Motor.—Cornelius Mesler, Almond, N. Y.:

I claim the wheel, E, endless chain, F, provided with buckets, G, penstock, A, stationary tube. B, and adjustable tube, C, all arranged substantially as and for the purpose herein set forth.

[This invention consists in the employment or use of a wheel, provided with an endless chain having buckets attached to it at equal distances apart; in connection with a vertical adjustable tube, a stationary tube, and a penstock, whereby it is believed that a cheap, simple, and durable means is employed for obtaining a large percentage of the power of water.]

44,011.—Grain Separator.—F. H. C. Mey, Buffalo, N. Y.:

I claim, first, The wheel, I, constructed and adapted to be rotated by the weight of the descending grain, and arranged in relation to the feed spout, J, as shown, in combination with the governor, N, and valve, K, all arranged to operate substantially in the manner as and for the purpose herein set forth.

Second, The self-adjusting or counterpoised valve, H′, in combination with the governor wheel, I, and with the rotary discharging plate, Q, arranged in relation to the draught passage of the device, and operating substantially as and for the purposes specified.

Third, The arrangement of the three cases, A C D, substantially as shown, to open the light grain discharging receptacle and drought passage, when said cases are used in combination with the fans, G, wheel, I, and valve, K, to operate conjointly, as set forth.

44,012.—Sulky.—A. Miller, Angola, Ind.:

I claim the elliptic spring, E, in combination with the rods, F F, adjustable boxes or guides, G G, and braces, J J, all arranged and applied to a sulky, substantially as herein shown and described.

[This invention relates to a new and useful improvement in the application of an elliptic spring to a sulky, whereby an easier riding sulky than usual is obtained, and one that is very strong and durable.]

44,013.—Quartz-crusher.—Thomas A. Morris (assignor to himself and F. R. Schettler), Green Bay, Wis. Ante-dated March 6, 1864:

I claim the employment or use of the scrapers, I, when used in connection with the rotating cylinder. E, provided with the quartz-bed, g, and the stationary drags, H, all arranged for joint operation, substantially as and for the purpose set forth.

44,014.—Mode of transmitting Motion by Belts.—Jacob Rand, Roxbury, Mass.:

I claim the suspending of one or more pulleys, D, within the rims of the driving wheels, A A, substantially in the manner and for the purposes described.

I also claim the V-shaped frictional groove, i, and corresponding projection, a′, for maintaining the proper endwise adjustment of the pulley, D, and at the same time increasing the grupe of the surfaces, substantially in the manner and for the purpose described.

I also claim the combination of a movable self-adjusting pulley, D, with the belt, G, rock snaft, F, and driving shaft, B, substantially as herein shown and described, so that the belt will be automatically loosened or tightened in proportion to the resistance of the rock shaft, all as set forth.

[The nature of this invention consists in suspending one or more belt pulleys between and on the inner surfaces of two rims, which project from the side faces of a pair of driving wheels on a single shaft; the motion of the driving wheels being communicated to the pulleys by the friction of said surfaces in contact with the suspended pulleys.]

44,015.—Churn.—Franklin Ransom, Buffalo, N. Y.:

I claim, first, The application and use of rotating blades or propeller, B, of much less diameter than the diameter of the churn tub, in combination with the perforated disk, F, and hollow cylinder, E (either or both of them), for the purposes and substantially as herein described.

Second, The perforated cylinder, G, in combination with the disk, F, and propeller, B, for the purposes and substantially as herein set forth.

Third, The break wings, f1 f2, placed either upon the upper or lower side of the disk, for the purposes and substantially as set forth.

44,016.—Bobbin.—Charles H. Reynolds, North Kingston, R. I.:

I claim, first, The use of an elastic packing made part of the bobbin or spool or secured thereto, so as to bear upon the surface of the spindle and hold the bobbin or spool thereto, substantially as described.

Second, Making the packing or friction surface of the bobbins or spools, whereby to hold them to their spindles, of a ring of elastic material, secured within the foot of the bobbin or spool, substantially as described.

44,017.—Lamp.—Hugh Sangster, Buffalo, N. Y.:

I claim the rim, L, with the recess, I, and the aperture, K, when made of one piece of sheet metal, as herein substantially set forth.

44,018.—Wind Wheel.—W. A. Santee, Dixon, Ill.:

I claim the shutters, F, pivoted vertically in frames, E, and connected by a rod, G, in connection with two vanes or governors, H, all arranged to operate in the manner substantially as and for the purpose set forth.

I also claim the loose arm, C′, one or more in connection with a catch or fastening, D, substantially as and for the purpose specified.

I further claim the eccentric, J, on the shaft, B, in connection with the U-spring, K, and rod, L, for closing the shutters of the loose arm, C′, when the latter is detached from the shaft, B, as described.

[This invention consists in constructing the sails of the wind wheel of a series of vertical shutters, connected by a rod and provided with governors; all being arranged in such a manner that the shutters will be opened and closed under the action of the wind, in order to ensure the rotation of the wheel. The invention also consists in using in connection with the shutters aforesaid, springs and a catch or fastening, with one or more loose sail arms to admit of the wind wheel being suddenly stopped when desired.]

44,019.—Corn Planter.—James Selby, Peoria, Ill.:

I claim, first, The links, h′ h′, jointed at their respective ends to the pivoted frame, D E F, and treadles, H H, and operating in the manner described, to facilitate the elevation of said pivoted frame.

Second, I claim the combination of the pivoted frame, D E F, with the adjustable plates, I I, for gaging the depth at which it is desired to have the runners work, substantially as set forth.

Third, I claim the scrapers, O O, in combination with the sliding plates, O′ O′, constructed and operating in the manner and for the purpose explained.

44,020.—Horse Rake.—A. J. Shunk, Shanesville, Ohio:

I claim the arrangement of the levers, d c b, and rocking rake-head, E, in combination with the adjustable rake-frame, C, substantially as described.

44,021.—Hog-cleaning Machine.—N. Silverthorn, Prescott, Wis.:

I claim the apparatus herein-described for removing from scalded hogs the hair, scurf, shine, etc., the same consisting essentially in the employment of substances of the requisite elasticity to yield to the irregularities of the body while adhering thereto with the force necessary to remove the hair and impurities, as set forth.

44,022.—Paper Shirt-collar.—Charles Spofford and Wm. S. Bell, Jr., Boston, Mass.:

We claim stretching or elongating that portion, f, of the collar which forms the outer fold, substantially as set forth for the purpose specified.

44,023.—Combined Time and Percussion Fuse for Shells. Charles W. Stafford, New York City:

I claim, first, The combination in one fuse of the following elements, to wit:—1st, the annular chamber, E, extending from front to rear of the fuse, to contain a time composition; 2d, the apertures, c′, affording communication between the said chamber and the interior of the shell; and 3d, the nipple plunger, B, surrounded by and adapted to slide within the chamber, E, the said parts being arranged to operate as herein specified.

Second, I claim the cap, b, provided with the apertures, b′, which operate in connection with the apertures, a3, in the manner described, so as to adapt the time fuse, E, to be ignited by the windage, or to be closed from communication therewith, as and for the purposes specified.

44,024.—Stop Motion.—Benjamin Stott, Westerly, R. I.:

I claim holding a belt shipper in position by means of centrifugal force, so arranged that when the said force is diminished beyond a given amount, a weight or other automatic force shall shift the belt, substantially as and for the purpose herein set forth.

44,025.—Composition for treating Leather.—A. Taw, Philadelphia, Pa.:

I claim a composition made by mixing tallow, horse fat, neats foot oil, fish oil, and bees wax, with the product obtained by the distillation of a mixture of animal fat and the residuum of petroleum or coal tar, in the manner and in about the proportions herein specified.

[The object of this invention is to produce a cheap and effective substitute for the ordinary "dubbing" or grease used in the treatment of tanned leather.]

44,026.—Meat-broiler.—George T. Teel, Hoboken, N. J.:

I claim the construction, combination, and arrangement of two separate and movable parts, as described and represented.

44,027.—Railroad Car Spring.—William Toshach, New York City:

I claim a spring for railroad cars or other vehicles, formed of two or more elastic bars, plates, or series of plates, which are rigidly confined at one end, when the vibrating extremities of any two of the same extend towards and cross each other, furnishing an even bearing for the load, substantially in the manner herein-before set forth.

When two or more elastic spring-bars, plates, or series of plates, are rigidly confined at one end only and so arranged as that their vibrating ends shall extend towards and cross each other, substantially as herein described, I claim combining therewith a relieving block or bar, e, of any suitable material, either elastic or non-elastic, placed centrally between the said elastic springplates, and so shaped as to gradually ease the same while bending under pressure, all substantially as herein set forth.

44,028.—Machine for making Packages of Tobacco, &c.—C. J. Van Oeckelen, New York City.

I claim, first, The employment or use in machines for making packages, of a platform, G, composed of a series of folding parts, a, b, c, d, e, with flaps, b′, c′, d′, e′, b″, c″, d″, e″, substantially as and for the purpose set forth.

Second, The reciprocating rising and falling tube, E, with the hopper, D, and plunger, H′, constructed and operating in the manner and for the purpose substantially as described.

Third, The lifter, K, provided with a hook, K′, and operated substantially in the manner described, so that it acts on the folding parts, b, and a, of the platform, in successive order.

Fourth, The arm, j′, applied in connection with the flap, b′, substantially as specified so that said flap will support the end of the wrapper until the charge has been introduced.

[The object of this invention is to make packages of tobacco or other articles or substances of a similar nature entirely by machinery the tobacco or other material to be wrapped up in a package, being measured off and pushed in the paper which is previously formed into a hollow tube to receive the charge, the whole being so arranged that it can be operated by steam or any other competent power, and that it requires but very little attendance and no hand labor except the measuring off of the material and the feeding of the paper to the machine, and a very large quantity of packages can be produced in a short time.]

44,029.—Machine for introducing Pegs and Cement into Soles, &c.—Elmer Townsend, Boston, Mass.:

I claim a combination composed of a pegging machine (whether with or without an awl for making holes in an article to be pegged) and a mechanism or apparatus either for introducing cement into the awl hole or holes for the reception of the peg or pegs, for applying cement to the pegs preparatory to their being driven, or for applying a cement softening liquid to pegs previously covered either in whole or in part with cement, and prior to such pegs being driven; the object or purpose of such combination being as herein before set forth.

44,030.—Ventilating Damper and Register.—Mr. J. Towne, Newton, Mass.:

I claim the curved and convex damper, C, pivoted at or near the center of a box, A, of corresponding contour, operating substantially as described for the purpose specified.

44,031.—Diaper Pin—Albert Warner, Hoboken, N. J.:

I claim a diaper pin provided with a circular spring guard, B, and notched bulbs, a, a, in the manner and for the purpose, substantially as shown and described.

[This invention consists in the employment or use of a circular spring guard provided at its end with notched bulbs in combination with the pin, which is hinged to said spring-guard at a point opposite the notched bulbs in such a manner that the point of the pin after the same has been passed through the diaper, can be readily forced in between the notched bulbs which retain and protect the same, and thereby the pin is prevented from opening spontaneously or from scratching or injuring the body of the infant wearing the diaper.]

44,032.—Hoe and Seed Planter.—Charles H. Wolcott, Randolph, N. Y.:

I claim the seed distributing device composed of the box, C, slide, E, and tube, D, when used in connection with the plate, G, and all combined with a hoe to operate in the manner substantially as and for the purpose herein set forth.

[The object of this invention is to combine a seed distributing device with a hoe, by which the hoe may be used in the ordinary way to perform its usual work, and the seed distributed at any time at the will of the operator, without the liability of having the seed-distributing device choked or clogged with earth so as to prevent it from operating perfectly.]

44,033.—Car Spring Fastener.—John W. Wood, Philadelphia, Pa.:

I claim the rectangular taper holes, B, the slotted lugs, D, and the wedges, F, when arranged and combined in the manner and for the purpose as above particularly set forth.

44,034.—Door Spring.—W. H. Worcester and E. F. Jones, Farmington, N. H.:

We claim as a new article of manufacture the door-spring herein-before described consisting of the casing, B, spring, C, chain, e, and roller, a, and concave plate, D, all constructed and arranged as herein specified, and constituting a complete device adapted for ready application (independently of the hinges) to a door or gate already in use.

[This invention consists in inserting the spring in the door in such a manner that it will be entirely out of view, and connecting the same by means of a chain or an equivalent means, with the door-post, all being so arranged that the spring will be not only concealed from view but also fully protected from external causes which would have a tendency to injure it or impair its perfect action.]

44,035.—Weeding Hoe.—Aaron B. Adams, Westport, Conn., assignor to himself and Wm. C. Street, Norwalk, Conn.:

I claim the adjusting slot, a, in combination with the pole, C, wheel, E, and hoe, A, all constructed and operating in the manner and for the purpose substantially as herein shown and described.

[The object of this invention is a weeding hoe, which is pushed ahead by the operator so that he has his work before his eyes and in pushing the hoe through between the hills and drills of growing plants, or on the ways of a garden, or wherever weeds are to be removed, said hoe can be readily guided to take all the weeds without injury to plants.]

44,036.—Car Brake.—A. J. Ambler, Chicago, Ill., assignor to himself and Gustavus Shepard, New York City.:

I claim the employment or use, in connection with a tensonial chain, F, and a brake chain, G, of fixed and sliding sheaves arranged substantially as herein shown, or in any equivalent way, so that by operating the tensonial chain, F, a movement will be imparted to the brake chain, G, to set or apply the brakes, and the slack of the tensonial chain be taken up by the falling of the sliding sheaves when the power is taken off from said tensonial chain.

I further claim limiting or controlling the maximum power of the brakes by limiting the rising and falling movement of the sheaves, E E′, by having the axles, b, of said sheaves fitted in slots, a, in the bars, D′ D″, or other fixtures, substantially as set forth.

[This invention relates to an improvement in that class of railroad car brakes in which a tensonial chain, or rods and chains, are used for operating or applying power from the locomotive to the brakes of a train of cars.]

44,037.—Machine for making Twist Drills.—A. R. Arnold, assignor to the Manhattan Fire Arms Company, Newark, N. J.:

I claim the arrangement of the two rotating cutters, whether for cutting or finishing the two grooves, and acting simultaneously on opposite sides of the blank, substantially as described, in combination with the mandrel for carrying the blank and having a simultaneous longitudinal and rotary motion substantially as described, whereby

© 1864 SCIENTIFIC AMERICAN, INC.

I am enabled to cut or finish both grooves at the same time and of the required pitch, without tendency to spring the blank, as set forth.

I also claim moving the cutter or cutters gradually from the axis of the blank to make the groove or grooves of gradually less depth by means of the sliding poppet (or poppets) in which the cutter (or cutters) is mounted, the sliding mandrel with a collar, or equivalent thereof, and the mechanism, or the equivalent thereof, by which the rising of the mandrel communicates the required motion to the poppet for cutting the grooves of gradually less depth, as set forth.

I claim the arrangement of gearing for communicating rotary motion from the shaft, k, to the wheel, o, in which the mandrel, c, slides and to which it is feathered so as to be turned thereby, in combination with the rotating screw-shaft, q, which receives motion from the mandrel, c, substantially as and for the purpose specified.

And I also claim the combination and arrangement of gearing herein described, for transmitting motion from the driving pulleys, n′, to the lever cutters, g.

44,038.—Automatic Air Damper for Hot Water Heating Apparatus.—W. C. Baker, (assignor to himself and John J. Smith) New York City.:

I claim regulating the supply of cold air to the radiator or heater automatically by the varying temperature of the water employed to heat the radiator, substantially as and for the purpose set forth.

44,039.—Basket.—Evelyn Beecher, Plymouth, Conn., assignor to Hoadley, Beecher & Co., Waterbury, Conn.:

I claim a wood woven basket furnished with a grooved wooden rim, in the manner herein shown and described.

44,040.—Biscuit Board and Flour Chest.—D. E. Bryer, (assignor to himself and E. Maurer) Logansport, Ind.:

I claim a chest provided with a lid or cover applied to it in the mannersubstantially as herein shown and described to admit of said lid or cover being adjusted in the several positions specified, to form a new and improved flour chest and biscuit board as set forth.

[This invention consists in attaching a lid or cover to a chest in such a manner that it may be adjusted in an upright position when access to the chest only is required, and also be capable of being adjusted in a horizontal position when designed to be used as a biscuit board, the chest being used as a receptacle for flour, bread, spices, etc., ect.]

44,041.—Cooking Range.—Reuben R. Finch, (assignor to himself and Uriah Hill, Jr., and Nathan L. Finch, New York City:

I claim first, The arrangement of the flues t, u, and v, damper, r, and flue, g, by which the heat is regulated in its action on the oven, or the products of combustion passed directly to the chimney as set forth.

Second, I claim the construction of the damper, r, as an arc of the circle moving on the pin, 3, and acting between the plates 2 and 5, as set forth.

Third, I claim the perforated brick or soap stone, n′, with a space between that and the oven plate opening to the ash pit, for the purpose specified.

Fourth, I claim the register plate, d, in combination with the perforated bricks, n′, for the purposes and as specified.

Fifth, I claim the slide or secondary door, 7, in the oven door, for the purposes and as specified.

44,042.—Straw Cutter.—W. P. Goolman, (assignor to Goolman, Morris & Co.,) Indianapolis, Ind.:

I claim the combination of the box, N, with the stud, P, and set screws, a, a, a, the elastic substance, X, the washer, T, and nut, U, all arranged and operating substantially as and for the purpose shown and described.

44,043. — Syphon for separating Gold from crushed Quartz—A. W. Hall, (assignor to himself, Samuel Jandon and B. H. Belden,) New York City:

I claim a syphon provided with a quantity of quicksilver, and arranged substantially as herein shown and described, for drawing off the pulverized quartz, and fine particles of gold held in suspension near the surface of the water in the crushing device, and separating the gold from the foreign substances contained with it in the water, as set forth.

I further claim the external steam tube, A, in combination with the internal tube, B, or syphon proper, all arranged substantially as and for the purpose specified.

44,044—Fruit Paring Machine.—Wm. M. Howland, (assignor to himself and John H. Lockey,) Leominster, Mass.:

I claim the employment in the same knife stock of suitable device for giving to it a vibrating or rocking movement in a plane transverse to the plane of revolution of the fruit in combination with a vibrating or rocking movement in a plane coincident with the plane of revolution of the fruit, substantially as described.

44,045.—Thimble with Guarded Cutters.—William Miller, (assignor to himself and John Murphy,) Boston, Mass.:

I claim a thimble having the guard, 6, attached or provided in combination with the cutter or cutting edge, a, substantially as and for the purpose herein specified.

[This invention consists in the attachment to a sewing thimble of a cutter or cutting edge to cut thread. It also consists in so applying a guard or shield in combination with such cutter as to protect its edge and to prevent it from cutting accidently or catching in the work.]

44,046.—Preparing Metallic Substances for Enameling, Japanning and Inlaying.—David Rait, (assignor to Samuel J. Glassey,) New York City:

I claim the processot preparing metallic substances for enamelling, japanning or inlaying by depositing metals by the action of galvanic battery upon the reverse of the pattern to be enamelled, jappaned, or inlaid, substantially as above described.

44,047.—Bit Holder for Bit Stock.—Louis C. Rodier, (assignor to Samuel Norris,) Springfield, Mass.:

I claim first, A bit holder, when constructed and arranged for operation substantially as described.

Second, In combination with a tool socket of otherwise ordinary or suitable construction I claim the employment of a right and left hand ratchet box, together with a circular double ratchet plate under the arrangement described, so that the said ratchet plate may be brought into working contact with either the right or left hand ratchet teeth of the box and thus transmit the vibratory motion of the handle or crank of the the holder to the bit, to determine its rotary movement either to the right or the left, as the case may be.

44,048.—Pegging Machine Joseph F. Sargent, (assignor to Elmer Townsend,) Boston Mass.:

I claim the arrangement in a pegging machine of an awl bar and a peg driver bar, so connected that they operate in vertical directions as one bar, while capable of lateral adjustment with respect to each other to vary the spacing of the pegs.

I also claim the arrangement or combination of the cam for producing the lateral movement of the awl (or peg driver) in juxtaposition with the cam which produces the vertical movement of the awl and peg driver, one cam being placed on or confined to the cam wheel, and the other cut therein, and both working in or nearly in the same vertical plane.

I also claim the manner of varying the throw of the spring plate, by the use of cams of different sizes, to operate on the friction wheels substantially as set forth.

I also claim hanging or suspending the swing plate on the center pin, i, midway between the top and bottom of the plate, so that lateral movement of the top plate in one direction produces corresponding movement of the awl and peg driver in the opposite direction.

I also claim the arrangement to operate together of an awl and awl bar foot, for feeding the work, a peg tube which vibrates laterally above the plane or surface of the shoe, and a rest or foot piece which holds the shoe in place, substantially as described.

44,049.—Pegging Machine.—J. F. Sargent (assignor to Elmer Townsend), Boston, Mass.:

I claim the arrangement of the awl and peg-driver, of an awl feed pegging machine to move upward together by a positive movement, while the peg-driver is driven downward by a spring, and the awl by a positive movement, substantially as set forth.

I also claim imparting the upward movement to the peg-driver bar and awl bar by the eccentric, l, connecting rod, k, and lifter, o, in the manner substantially as described.

I also claim the combination of the tripping lifter, o, and spring, s, for actuating the peg-driver bar, substantially as described.

I also claim the manner of effecting the change of spacing, and throw of the awl, by means of the adjusting screw, t, cam, l, and rolls, v w, operating together, substantially as set forth.

I also claim the combination of a pointing tool or tools and a cutting-off knife, so arranged as to operate in the same plane, to point the pegs in the strip, and sever them therefrom, substantially as above described.

44,050.—Machine for making Chenille.—Joseph Thomas (assignor to himself and Calholina Lambert), New York City:

I claim, first, The hollow mandrel, G g2, and exposed pulley, G2, on the outside thereof, in combination with the operative parts of a chenille machine, and arranged relatively thereto, substantially in the manner and for the purpose herein set forth.

Second, I claim the tension cord, H, and weight, I, arranged relatively to the operative parts of a chenille machine, substantially as and for the purpose herein set forth.

Third, I claim in chenille machines the knife, P, arranged between two compressing rollers, M and N, or their equivalents, and adapted to sever the material at two points in each circuit.

44,051.—Steel Shirt Collar.—Richard Woodward, Joseph Priest and Otis Ernst (assignors to Otis Ernst), New York City:

We claim, first, Uniting the two pieces of sheet-metal forming the collar by a rivet or joint, for the purpose and as specified.

Second, We claim connecting the collar to the button by the notches or openings in the respective parts of the collar that grasp the shank or attachment of the button, as specified.

Third, In combination with a metallic collar we claim a hook on the inside of the collar at the front, to take the button-hole of the shirt collar, as specified.

44,052.—Machine for spooling Cotton, &c.—Godfrey Ermen and Robt. Smith, Manchester, England. Patented in England Nov. 25, 1862:

We claim, first, the reversible or revolving frame, G, set in eccentric bearings and carrying the gearing that drives the spools, as specified, so that one range of spools is in gear while the other is stationary, as and for the purposes set forth.

Second, We claim the sliding frame, Q Q2, escapement, b, pallets, c c′, and screen, m, for regulating the extent of travel of the thread guides, P, substantially as specified.

Third, We claim the weights, R′, and platform, t, in combination with the thread guide, P, and weighted lever, e, for the purpose and substantially as specified.

Fourth, We claim the latch, y, and disk, D2, in combination with the lever, e, and adjustable sector, d3, for stopping the machine, as set forth.

44,053.—Method for purifying Acetic Acid.—Adolphe Amedei Fesguet, Marseilles, France:

I claim the purification of crude pyroligneous or impure acetic acid by the destructive action of sulphuric acid upon the impurities therein contained, substantially as set forth in the above specification.

44,054.—Apparatus for Stoppering Jars and Bottles.—Nathan Thompson, St. John's Wood, England. Patented in England March 9, 1864:

I claim the constructing and forming the first, third and fourth parts, severally, of the stoppering apparatus, substantially as herein before described.

Also the combining the several parts of the stoppering apparatus substantially as described.

44,055.—Locomotive.—George Thomas, Frankfort-on-the-Main, Germany, assignor to Bernhard Schaffer and Christian Budenberg, New York City:

I claim the application to a locomotive of horse-pipes, d e* g, with or without an additional air chamber, F, and with suitable stop valves, a a* g′, in the manner and for the purpose substantially as herein shown and described.

[This invention consists in the use of an ordinary locomotive as a steam fire-engine, either by connecting the force pump or pumps of said locomotive with an air chamber or by applying the power or a portion of the power of a locomotive to any other pump or device for forcing a current of water through a suitable pipe or pipes, in such a manner that with very little extra expense an ordinary locomotive can be transformed to a fire-engine or pumping engine, and used as such in cases where it may be desirable.]

44,056.—Manufacture of Table-cutlery.—Lorenzo Rice, West Winsted, Conn.:

I claim the mode or method of attaching the bolster to the knife or fork, for the purposes herein set forth, with a pin, nipple or spur on one or both half parts of the bolster, and as herein set forth, holding them firmly during the process of heating and welding the bolsters to the blade or fork, as herein set forth, or any other mode substantially the same, or by which the same results can be produced.

44,057.—Telescopic Sight for Rifles.—Joshua B. Wood, Norwich, N. Y.:

I claim, first, the raise-and-fall or up-and-down movement, also the lateral or right-and-left movement combined together, forming a new arrangement, and operating in harmony with each other, for the purposes set forth.

Second, The slotted notched tube, E, for the purposes described.

RE-ISSUES.

1,749.—Stuffing for Mattresses.—Henry A. Alden, Matteawan, N. Y. Patented Feb. 16, 1864:

I claim as a new manufacture the production of mattresses, chair seatings, and other articles of furniture, bedding, etc., in which the stuffing is composed of sponge prepared in the manner substantially as herein set forth.

1,750.—Folding Chair.—James G. English and Edwin F. Mersick, New Haven, Conn., assignees by Mesne Assignments of James H. Swan, New York City. Patented Aug. 21, 1860:

We claim, first, A folding chair composed of jointed cross legs with a flexible seat, having combined with it a back and arms, the back being attached to the rear and upper ends of the front legs by hinge joints, as described, while the arms are connected in like manner with the front and upper ends of the rear legs, substantially as set forth.

Second, The combination of a cross-leg chair with flexible seat and a back and arms, the whole constituting a folding arm-chair when arranged for operation as described, so that the folding of the chair is or may be effected by drawing the legs together and by swinging the back over and backward, substantially in the manner and for the purposes set forth.

Third, An arm-chair, folding as described, in which the back is capable of adjustment, substantially in the manner and for the purposes set forth.

Fourth, In folding arm-chairs operating as described we claim the employment of jointed arms in combination with adjustable stops or pawls, as set forth.

1,751.—Cigar Machine.—T. A. Heald, Washington, D.C. Patented Aug. 6, 1861:

I claim, first, Running a belt in the form of a loop, whereby a single belt is made to inclose and form a bearing for the whole outside surface of the cigar with the exception of a sufficient space to admit the wrapper.

Second, The use of a belt of unequal thickness, for the purpose of giving to the cigar any required degree of taper, or for giving it any other desirable form substantially as shown.

Third, The rotary brush, L, when used for the purpose of facilitating the insertion of the wrapper, and to insure the winding of the same around the filling.

Fourth, I claim forming or shaping the end of a cigar, by means of a series of rotary cutters having either smooth or serrated edges, substantially as described.

Fifth, I claim finishing or cutting off the end of a cigar, by means of the rotary cutter, N, or its equivalent, substantially as described.

Sixth, I claim applying paste to the wrapper of a cigar, at the moment of applying said wrapper to the cigar, by means of the brush, M, or its equivalent, substantially as shown and described.

1,752.—Machine for finishing Gas-pipe Fittings.—Malleable Iron Fittings Company, Bradford, Conn., assignees by Mesne Assignments of Caleb C. Walworth, Boston, Mass. Patented Oct. 7, 1856:

What is claimed is a machine so organized as to be capable of operating at the same time, on two or more ends of pipe fittings, which are located at angles with each other, substantially as set forth.

1,753.—Mode of Desiccating Articles of Food.—Masa Branch, Southwick, St. Hilaire, Canada. Patented Sept. 15, 1853:

I claim, first, The process of desiccating food, composed of either vegetable or animal substances, by means of the direct application of an artificial current of hot air.

Second, I claim the revolving tube, B, or its equivalent, in combination with any mechanical device for creating and applying a current of air, substantially as specified.

Third, The cylinder, D, constructed and operating as and for the purpose set forth, whether used in combination with the revolving table, B, or not.

Fourth, The rake, F, in combination with the revolving table or its equivalent.

Fifth, I claim the roller, G, in combination with the table, B, or its equivalent, when constructed and operating substantially as set forth.

1,754.—Machine for Miter Dovetailing.—John M. Nichols, Brooklyn, N. Y., assignee by Mesne Assignments of F. A. Gleason, Rome, N. Y. Patented March 7, 1863:

I claim, first, Forming a miter with a dovetail tongue and a dovetail groove at one operation by cutters that act with a drawing cut and form a smooth surface, substantially as specified.

Second, Forming at one operation a dovetail groove on one side and a dovetail tongue on the other side of a miter joint and separating crosswise a piece of lumber, substantially as specified.

Third, A series of standing cutters arranged as specified so as to produced a proportionate increase or decrease in the size of the tongue or groove, in the act of adjusting such cutters for different thicknesses of material, as specified.

Fourth, Forming the standing cutters for dovetail miters as an arc of a circle, as specified, so that such cutters can be more compact than would be the case if straight cutters were employed, as set forth.

1,755.—Skeleton Skirt.—Cesar Neumann, New York City. Patented Aug. 16, 1859:

I claim, first, The divided hoops, A A, to adapt the skirt to be opened in front from top to bottom.

Second, The combination of the jointed or hinged hoop supporters, B, and a series of horizontal wires, A, when arranged and operated in the manner and for the purpose substantially as set forth.

Third, The additional wires or extension pieces, D, connected to the main wires, A, of a hoop skirt and to each other by clasps, buttons, hooks, or other equivalent means, so that they can be readily opened and closed and at the same time the skirt can be enlarged or contracted.

Fourth, The metallic waistband, E, in combination with a hoop skirt.

1,756.—School Seat.—Robert Paton, New York City. Patented Aug. 20, 1861:

I claim a folding seat, D, attached by joints, d, to the side frames, A, with stationary supports, c, on the side frames situated anywhere below or underneath the seat, for the purpose of supporting the latter, substantially as set forth.

1,757.—Harvester.—Wm. N. Whiteley (assignee of Abner Whiteley), Springfield, Ohio. Patented April 24, 1855:

I claim, first, The combination of the narrow divider, short cutter and grain wheel, arranged and operating substantially as herein described for the purposes specified.

Second, The combination of the narrow divider, short cutter, grain wheel and its adjusting mechanism arranged and operating substantially as herein described, for the purposes specified.

Third, The combination of the herein-described platform, reel and automatic rake, or an equivalent of this combination, for the purposes specified.

Fourth, The combination of the herein-described platform, reel, automatic rake, and counterbalance for the rake, or an equivalent of this combination, for the purposes specified.

Fifth, The combination of the herein-described platform, reel, automatic rake, guides which guide and keep the rake in its proper path, or an equivalent of this combination.

Sixth, The combination of the herein-described platform, reel, automatic rake and shipping mechanism for the rake, or the equivalent of this combination, for the purposes specified.

Seventh, The combination of the herein-described platform, reel, automatic rake and shipping mechanism for the reel, or an equivalent combination, for the purposes specified.

Eighth, The combination or arrangement of the following parts or elements in a harvester: the narrow divider, the short cutter, the grain wheel at its end, the platform, the reel, and the automatic rake herein described, so as to cut the grain in the best manner, remove the gavels in the gavels in the best manner, and deposit them at the best place by one continuous automatic operation.

1,758.—Harvester.—Wm. N. Whiteley (assignee of Abner Whitely), Springfield, Ohio. Patented April 24, 1855:

I claim, first, The alternate spaces in rear of the cutter bar and sections of the cutter, combined with the shoulders of the fingers against which the cutter bar works, for the purpose of altering the bearings, as and for the purposes set forth and described.

Second, The cutter section, f, seen at fig. 9 of the drawings, serrated on the flat side and beveled on the other, substantially as and for the purposes set forth and described.

Third, The combination of the herein-described platform, automatic rake and its driving mechanism, or their equivalents, for the purposes specified.

Fourth, The combination of the herein-described platform, automatic rake, its driving mechanism and its shipping mechanism, or their equivalents, for the purposes specified.

Fifth, The combination of the herein-described narrow divider, short cutter, grain wheel at its end, platform, automatic rake, and its driving mechanism, or their equivalents, so as to cut the grain, remove the gavels and deposit them, as herein described, at one continuous automatic operation.

EXTENSIONS.

Surgeons' Splints.—Benjamin Welch, Salisbury, Conn. (formerly of Lakeville, Conn.) Patented Sept. 3, 1850:

I claim my improved surgeons' splints, composed of thin strata of wood combined with some elastic adhesive substance interposed between them, substantially as herein set forth.

Direct-action of Steam Hammers.—John H. Towne, Philadelphia, Pa. Patented Sept. 3, 1850:

I claim attaching the hammer to the sliding steam cylinder, substantially as herein described, the steam being admitted and discharged to and from the sliding steam cylinder, substantially as here in described.

For the Week Ending Sept. 6, 1864.

44,058.—Curd-cutter.—F. G. Abbey, Sandisfield, Mass.:

I claim, first, The feed-box, A, and automatically-feeding follower C, in combination with the three sets of knives, B and D, and reciprocating gate, E, constructed and operating in the manner and for the purpose substantially as herein shown and described.

Second, The employment or use, for the purpose of cutting cheese curd, of three sets of knives, situated in planes at right angles to each other and operated substantially in the manner specified or in any other equivalent manner to produce a like effect.

44,059.—Apparatus for washing the Felts of Paper Machines.—Alexander Anderson, Milwaukie, Wis.:

I claim the method of washing felts in the process of manufacturing paper, by projecting jets of water upon both surfaces of the felt while in motion, by means of an apparatus to be constructed and operated substantially as herein described.

44,060.—Apparatus for carburetting Air.—Ellis S. Archer, New York City:

I claim a carbonizer consisting of a hollow drum or chamber to be partially filled with hydro-carbon liquid and provided with one or

© 1864 SCIENTIFIC AMERICAN, INC.

more cylinders or diaphragms of textile fabric through the texture of which the air or gas to be carbonized is passed, substantially as and for the purposes set forth.

44,061.—Combined Time and Concussion Fuse.—Clifford Arick, St. Clairsville, Ohio :

I claim, first, Constructing a Bormann fuse case with its magazine on its index side, and with an independent concentric fire chamber, between its fuse chamber and magazine, substantially as described.

Second, Combining with the magazine of a Bormann fuse case and acting as a bottom to it, a hollow pin, to serve as a means of fastening it in a shell or as a conductor of its flame through an intervening space or obstacle to the bursting charge thereof, substantially as set forth.

Third, Combining with a Bormann fuse case, thus constructed, with or without its independent fire chamber by means of a central hollow pin, a concussion or percussion fuze, either or both, and whether ignitible by, or independent of, the windage flame, substantially as described.

Fourth, So combining in a Bormann fuse case, a fuze and concentric fire chamber, that when the fuse is cut at the desired point, the partition wall between the two chambers may be conveniently included in the cut, and they be thereby united, substantially as described

44,062:—Apparatus for preparing Peat Fuel.—Edward H. Ashcroft, Lynn, Mass., and Albert Betteley, Boston, Mass.:

We claim the arrangement of a triturating, separating and desiccating mechanism, to operate together in the manner and for the purpose substantially as set forth.

We also claim the employment of the two series of revolving arms, i k, or for separating the fibrous and undecomposed part of the peat from the finer and decomposed parts, substantially as set forth.

We also claim the use of a feed screw in combination with a gate or retarder, by means of which the peat is compressed and fed, substantially as described.

We also claim the combination of the coring rod, x, and tube, z, to operate in the manner set forth.

44,063.—Sewing Machine.—Bryan Atwater, Berlin, Conn. :

I claim, first, Placing the arms of the forked device, M, with its springs, s s′, or the equivalent thereof, vertically and in relation to the needle and its thread, substantially in the manner and for the purpose described.

Second, I claim placing the springs, s s′, in recesses in the arms of the forked device, M, or guiding and controlling their movement by some other equivalent means, so that they will properly co-operate with the needle, substantially as described.

Third, Giving to the forked device, M, a reciprocating movement in a vertical direction in combination with the movement in a horizontal direction to enable it to co-operate with the shuttle or other device, which carries the binding thread into the loop of the needle thread, substantially as described.

Fourth, I claim the employment of a small bevel upon the point of the shuttle, upon the side thereof next to the needle, in combination with the forked device for opening the loop of the needle thread, substantially as described.

44,064.—Harvester.—George Bailey, Wiscotta, Iowa. Ante-dated Dec. 11, 1861 :

I claim, first, The combination of the hinged platform, the pivoted side levers and vertically adjustable cross-bar, so arranged as to allow the gavel to be raked off under the main frame, substantially as and for the purposes set forth.

Second, In combination with the up-and-down adjustable cross-bar to the sickle frame, a swiveling or pivoted bracket for supporting, in connection with the cross-bar, the cutter driving gear, and to admit of perfect adjustment of the latter to its driver in effecting the up-and-down adjustment of the sickle frame, substantially as herein specified.

Third, In combination with the cross-bar, L, and the pinion or bevel wheel, M, arranged in relation to each other, to operate substantially as described, I claim the curved guide or guides, b, for the purposes set forth.

44,065.—Courses or Lower Sails of Square-rigged Vessels.—Samuel W. Baxter, Dennis, Mass., and J. W. Chapman. Barnstable, Mass. :

We claim, first, The combination of the tacks and sheets at the division of a sail formed of two parts, as and for the purposes set forth.

Second, We claim uniting the two halves of a sail by means of fair leaders, with a rope rove thereon, or the equivalent thereof, so that the sail can readily be united or disunited, as is required and herein specified.

Third, We also claim the shackles, fig. 4, formed of two parts for uniting the lower corners of the divided sail, as set forth.

44,067.—Skate Fastening.—Theodore Bergner, Philadelphia, Pa. :

I claim, first, The described elastic stays when forged upon the runner of the skate, or otherwise attached to the same, and when their projections, d d, are actuated by clamping screws or their equivalents, substantially as and for the purpose specified.

Second, The use of a ferrule or its equivalent as a guard upon the clamping screws, substantially as set forth.

Third, Supporting the rear end of the toe plate, upon the front clamping screw in the manner and for the purpose described.

44,067.—Self-centering Chuck.— Edgar B. Beach, West Meriden. Conn.:

I claim the inclined converging guide-ways, c, in combination with the jaws, C, head, B, and screw spindle, A, constructed and operating in the manner and for the purpose substantially as herein shown and described.

44,068:—Dumping Cart.—Theodore Blodgett, Belchertown, Mass. :

I claim the combination and arrangement of the eccentrics, F F, with the shaft, G, the scoop, D, its lifting chains, E E, and the operative mechanism of such shaft.

I also claim the arrangement of the scoop, D, on the axle of the supporting wheels in combination with the arrangement of the scoop elevating machinery on the thills, as specified.

I also claim the combination of the hinged door, e, and its holding mechanism, f g, with the scoop, D, its elevating mechanism and the wheels and thills, or their equivalents, for connecting one or more draft animals to the cart.

44,069.—Saw-mill.—Caleb Bond, Richmond, Ind.:

I claim, first, The application of the clamp, I, and set screw, b, in combination with the cross-head, G, of the saw, H, substantially as herein specified, so that by the action of said set screw the pitch of the saw can be adjusted.

Second, The vertically-adjustable spring guides, d, in combination with the arms, e, and saw, H, constructed and operating substantially as and for the purpose set forth.

Third, The sliding friction clutch, q2 q2*, in combination with the pulley, q4, cog wheel, p2, shaft, q, and hand wheel, q7, applied substantially as herein specified, so that the carriage can be moved in either direction by hand or by power, as may be desirable.

Fourth, The hand wheel, O6, on the vertical arbor, o5, in combination with the belt shipper, o4, cone pulleys, o2 o3, and belt, o1, applied substantially as herein set forth, so that the sawyer is enabled, by turning the hand wheel, to regulate the feed.

Fifth, The swinging frame, N, roller, M, and weight, O, in combination with the spring-stop, b, and hand lever, b, constructed and operating substantially as and for the purpose set forth.

44,070.—Cigar Machine.—C. G. H. Brinckmann, New York City :

First, I claim the forming the core or bunch with a nearly conical head that is corresponding to the shape of the finished cigar except in having its tip cut off, substantially as shown and described, for the purpose set forth.

Second, The employment of a series of yielding rolls adapted to receive and turn the cigar core between them, in the manner substantially as hereinbefore set forth.

Third, I also claim the employment of header block, J J′, mounted in such manner as to yield to the pressure exerted upon them, in the manner and for the purpose described.

Fourth, I also claim so arranging each of the rolls, E, that it will yield under less pressure near the end intended to be nearest the butt of the cigar, substantially as and for the purposes set forth.

Fifth, I also claim the employment of the spring rod, n5, or its equivalent, as and for the purposes set forth.

Sixth, I also claim combining with the header block a socket inserted rolls, or a continuation of the main rolls, for the purpose of decreasing the friction or dragging tendency on the surface of the cigar head.

Seventh. I also claim the employment, in combination with the header blocks, of the stop rod, q, or its equivalent, arranged to operate as and for the purpose set forth.

Eighth, I also claim the employment of an automatic guide on which the hook of the wrapper, may be held and by which it will be guided, substantially as and for the purpose described.

Ninth, I also claim the employment, in combination with the rolls and header blocks for forming and wrapping the cigar of an adjustable springing stop, G, as and for the purpose described.

Tenth, I also claim the combination with the rolls, E, of regulator plates, c c′, or their equivalents, the whole arranged to operate substantially as and for the purposes described.

44,071.—Valve Gear for Steam Engines.—Edward Brown, Philadelphia, Pa. :

I claim, first, operating the slide valve of a steam engine by means of a single eccentric, c, and a cam or grooved disk, A, when the said grooved disk is shaped as described, and the point of cut off varied by turning the said cam on the shaft, substantially as described.

Second, The combination of the eccentric, C, disk, A, flange, B, roller, L, arm, m, rods, Q Q′, and lever, R, arranged and operating substantially as described.

44,072.—Blind-slat Fastening.—J. D. Burdick, Ashway, R. I. :

I claim the bent lever, C, fitted within a suitable case or socket, B, and applied to the blind, A, so as to turn or work in a plane parallel therewith, in combination with the rod, E, attached to the short arm, h, of the lever, C, and to the slat rod, b, and the spring, E′, fitted on the rod or axis, D, of the lever, between said lever and the inner side of the case or socket, B, substantially as and for the purpose herein set forth.

44,073.—Slide for Extension Tables.—M. E. Carter and Elisha Mets, Rochester, N. Y.:

We claim a slide, D, combining the double T and double wedge or dovetailed form, the same consisting of the tongues, a a, and center, c, arranged in combination with the groove, E, and bars, A B C, substantially as herein set forth.

In combination with the slide, D, arranged as above described, provided with the notch, g, and with the groove, E, and bars, A B C, we also claim the pin, h, arranged and operating substantially as and for the purpose herein set forth.]

44,074.—Mode of forming Screws.—Charles H. Chandler, Foxcroft, Maine :

I claim the combination of the rotary mandrel, A, provided with a screw, a a, as described, with a die plate, said mandrel and die plate being used substantially as described.

44,075.—Apparatus for inhaling Gases.—W. Z. M. Chapman, New York City:

I claim the employment of the plate, f, affixed to the tube, e, placed within the lips, as and for the purposes described.

I also claim, in combination with the above, the shield, g, for the purposes herein set forth.

I also claim, in combination with the breathing tube, e, the tongue piece, e′, substantially as described.

I also claim, in combination with the breathing, apparatus the nose cover, all as herein specified.

I also claim the arrangement and operation of the valves in combination with the breathing tubes, substantially as and for the purposes herein set forth.

I also claim the indicator, substantially as and for the purposes described.

I also claim the separate pipe for saliva, etc., all as herein specified.

44,076.—Stop Hinge.—G. F. J. Colburn, Newark, N. J., assignor to the Scoville Manufacturing Company, Waterbury, Conn.:

I claim a hinge having one or more steps formed as described.

44,077.—Steam Plow.—James Curtis, Chicago, Ill.:

First, I claim a series of cutters fixed on and rotating with a shaft so as to cut the earth from the bottom of the furrow towards the surface, carry the earth taken up at each cut, over the cutters and deposit it in a reversed position, or turned over behind the cutters, substantially in the manner described.

Second, The combination of cleaners with the cutters when the cleaners are hinged near the edge of the cutters and forced over their concave surfaces by adjustable guides, substantially as and for the purpose described.

Third, The combination of guides or rollers, adjustable on the supporting arms of the cutter shaft, with the cleaners, with or without cams thereon, to discharge the earth from the cutters at the point desired, substantially in the manner described.

Fourth, The combination of the steering mechanism with the mechanism for elevating or depressing the cutter shaft so as to steer the carriage without changing the depth of furrow or to regulate the depth of cutting without or whilst changing the direction of plowing, substantially in the manner described.

44,078.—Car Wheel for Railroads.—Thomas Curtis, New Hudson. Mich.:

I claim the application to the wheels of railroad cars of the movable spurs, B B, operating substantially as and for the purposes set forth and described.

I also claim, in combination with, or for use in connection with, wheels armed with such movable spurs the use and application of the additional rail, E, for such spurs to act against, substantially as and for the purposes set forth.

44,079.—Horse Rake.—Moses Davenport, Minerva, Ohio:

I claim, first, Suspending a rake from a carriage by means of curved arms, or their equivalents, in such manner that the forward part of said rake will nearly counterbalance the rear part, in combination with means applied to raise and depress the rake and automatically lock it down in working position, substantially as described.

Second, The application of two treadles to a wheel rake when the rake is suspended by arms in such manner that its forward part will act as a counter-weight to the rear part, substantially as described.

Third, The combination of treadles, D D′, strap, a3, pulley, a1, and link, b, with a rake which is suspended by arms, d d, substantially as and for the purposes set forth.

Fourth, The combination with the driver's seat, D3, of the bars, h′ h′, rod, i, and notched bars, h h, constructed substantially as described.

44,080.—Stop-motion for Looms.—Christopher Duckworth, Mount Carmel, Conn.:

I claim the combination of the hooks, fig. 3, fork, fig. 4, and levers, a and k, with the rock shafts, H and I, when the whole is constructed, arranged and fitted to produce the desired result, substantially as herein described.

44,081.—Lamp.—R. N. Eagle, Washington, D. C. :

I claim a fastening, substantially as herein described, for securing one or more feeding wicks to a lamp.

44,082.—Arrangement of Desks for School-rooms.—H. G. Eastman, Poughkeepsie, N. Y.:

I claim the method of constructing and arranging the offices, desks, banks and lines of telegraphs, etc., as described, in combination with the school or college room, as hereinbefore set forth.

44,083.—Boiler for Hot-water Furnaces.—Charles R. Ellis, Brooklyn, N. Y.:

I claim, first, The hollow flue boxes applied above the fire, substantially in the manner and for the purpose specified.

Second, I claim the hollow bridge forming a circulating pipe extending from one side of the box, g, to the other as specified.

Third, I claim the pipe or pipes, m, in combination with the cross flue bridge, for returning the circulation water to the boiler near the said hollow bridge, as specified.

44,084.—Harvester.—Daniel L. Emerson, Rockford, Ill.:

I claim the combination of a track-clearer with a grass-wheel arranged relatively to the track-clearer, substantially as described.

I also claim the combination of the divider with an inclined sliding bar, so that the acting front end of the divider can be depressed by moving said bar, substantially as set forth.

I also claim the combination of the sickle with a clasp eye to hold a removable brush, the whole operating substantially as set forth.

I also claim the combination of the connecting rod of the sickle with a clasp eye to hold a removable brush, substantially as set forth.

I also claim the combination of the two beams of the frame of a harvester at the opposite sides of the main driving wheel, by means of the driving wheel axle, which is rigidly secured to both, the combination operating substantially as set forth, so that the necessity of a connecting piece in the rear of the driving axle is dispensed with.

I also claim a driving wheel axle constructed in one piece with the socket of the standard of the driver's seat, substantially as set forth.

I also claim the combination of the back beam (or its equivalent for supporting the rear of the platform of a harvester), with the frame of the machine, by means of radius bars, the whole operating substantially as set forth,

I also claim the combination of the main frame draught bar, and compound lever, the whole operating substantially as set forth.

44,085.—Car Coupling.—Henry Fake, Chicago, Ill.:

I claim the two bars, D D′, provided with hooks, d d, at their outer ends and fitted within the draw-head, A, on the pin, C, between the projections, B B, in combination with the springs, G G J J, and the sliding bars, E E H H, all arranged substantially as and for the purpose herein set forth.

[The object of this invention is to obtain a car coupling by which the danger af coupling by hand will be avoided, and one which will accommodate itself to all variations in the track, that is to say, admit of working or playing both horizontally and vertically under the movement of the cars, as the latter pass over the track or rails.]

44,086.—Alloy of Aluminum.—Moses G. Farmer, Salem, Mass.:

I claim the alloy compounded of the metals, and in the proportion substantially as specified.

44,087.—Horse Hay Fork.—Silas L. Gates, Verona, N. Y.:

I claim the two pairs of tines, B, attached to the bars, A, and connected together by the straps or plates, b, and rod, c, and secured to the hoisting rope, E, by means of the links, D D′, hook, d, lever, e, and eye, f, or their equivalents, substantially as and for the purpose specified.

[This invention consists in connecting two pairs of tines by means of a rod or shaft and straps, and having the bars of said forks connected by chains or links with the hoisting rope, one of said chains being connected with the cross-head of the tines by means of a hook and lever; all arranged in such a manner that the fork may be readily loaded with hay, and, when elevated over the desired spot made to discharge its contents with the greatest facility.]

44,088.—Water Wheel.—R. S. Hadley, Anamasa, Iowa :

I claim, first, The bucket, c, so formed or shaped as to have an upper semi-circular part, d, and a lower inclined surface, e, in connection with a bend, B, encompassing the whole, as set forth.

Second, The combination of the longitudinally curved and inclined chutes, f, semi-circular upper parts, d, and inclined plane parts, e, of the buckets, c, and enclosing band, B, all constructed, arranged, and employed as herein specified.

[This invention consists in constructing the buckets of the wheel in such a manner that their faces will have a concave and a plane surface, the former being at the upper, and the latter at the lower, part of the buckets, and in using in connection with said buckets a band which encloses them, either wholly or partially. The invention also consists in the employment or use of chutes placed in such relation with the buckets of the wheel as to cause the water to act upon the buckets in the most favorable manner to retain a large percentage of the power of the former.]

44,089.—Heating Stove.—John L. Hanson, Boston, Mass.:

I claim the combination and arrangement of the smoke spaces or chambers, F G, about the fire-pot, and the ash-chamber, with the heating pipes, o o, and the base flues, arranged around and below such pipes, substantially as specified.

44,090.—Dies for heading Screw Blanks.—Hayward A. Harvey, New York City :

I claim a die having the counter sink or matrix for the head formed in one part only thereof, so as to avoid finning as described, and having also a capacity to clamp the shank to prevent crippling by a construction, substantially as described, the die as a whole being constructed and capable of operating, substantially in the manner herein-before set forth

44,091.—Draft Regulator.—Ebenezer Harrington, Boston, Mass.:

I claim the combination in the base of the smoke pipe of the inclined deflecting plate, F, outlet, a a, opposite open rings, b b, and connected outwardly opening door, C, the whole arranged and operating substantially as herein specified.

[This invention consists in the combination of an internal slanting deflecting plate, and two opposite apertures of peculiar form fitted with connected outwardly opening doors, provided in the base of the smoke pipe of a stove or furnace, for the purpose of regulating the admission into the smoke pipe of air from the apartment in which the stove or furnace is placed, and thereby reducing the draft and ventilating the department in any desirable degree, without permitting the escape thereinto of any smoke.]

44,092.—Adjustable Collar for Stove Pipes.—George M. Hay, Johnstown, Pa.:

I claim, first, A chimney collar in which a series of pointed or sliding semi-circular sections, a a, etc., are employed to adapt the collar for pipes of various dimensions, substantially as herein set forth.

Second, I claim the combination of the plates, B B′, intermediate section, B2, cylinder, A, and slide, E, the whole being constructed and arranged to operate in the manner specified.

Third, I claim the slides, D D, folding doors, D′ D′, and pieces, C C, for adapting the opening in the cylinder, A, to be closed when the pipe is not in use, substantially as specified.

[This invention relates to a device which is located within a chimney or flue, and employed to support and retain in position the pipe leading from the stove; and its peculiar construction adapts it for effectual use in connection with a stove pipe of any dimensions.]

44,093.—Shoemaker's Edge Plane.—Charles E. Hersey, East Stoughton, Mass.:

I claim my improved edge plane as explained, that is, as having its knife or cutter, as well as its gage, provided with a dovetailed rib, and its stock constructed with corresponding jaws made in the manner, and provided with the notches, e e′, and furnished with a clamping screw as described, the same being as and for the purpose or objects as herein-before explained.

44,094.—Portfolio.—Lewis Heyl, Philadelphia, Pa.:

I claim, first, A portfolio having an extensible back, B, arranged in any manner, substantially as herein described, and employed to adapt the portfolio to contain any quantity or various quantities of the matter to be enclosed therein, as explained.

Second, I claim in combination with said extensible back, B, the adjusting spring, C, and notched plates, D D, arranged and employed substantially as set forth.

[The object of this invention is to provide a portfolio which may, by means of a simple contrivance, be adapted to contain any number of sheets—either many or few; and in order to thus render the portfolio capable of confining the various quantities which it is to enclose, the inventor employs a back piece in a novel manner, so that it may be extended or let out, and drawn in or contracted in such a way as to increase or diminish its width between the two leaves of the portfolio, after which it is adjusted by a spring.]

44,095.—Horse Cage.—William G. Hughes, Merriam, Ind.:

I claim the ropes, G G, windlass, F, adjustable sashes, E E′, halter windlass, I, and breast bar, J, all combined and applied to a framing, A, substantially as and for the purpose herein set forth.

I further claim the stand, M, provided with the adjustable uprights, N N′, having foot-sockets, P, at their upper ends, in combination with the ropes, G G, windlass, F, sashes, E E′, and either with or without the ropes, L L, and windlasses, K K, substantially as and for the purpose specified.

44,096.—Cider Mill.—Samuel G. Hurlburt, Cleveland. Ohio :

I claim, first, The arrangement of the cams, h, slide, J, lever, I′, in combination with the vibrating arm, I, and crushing rollers, c, as and for the purposes set forth.

© 1864 SCIENTIFIC AMERICAN, INC.

Second, I claim the arrangement of the cam, F′, follower, H, spring, S, screw, E, and gear, F, in combination with the cylinder, L, charger, K, and hoop, H, when operating conjointly as and for the purpose set forth.

Third, I claim the combined charger, K, and cylinder, L, when arranged in conn ction with the grinding or crushing apparatus, in combination with the clutch, Fig. 5, hoop, M, contractor, N, and gate, N′, when operating conjointly as and for the purpose described.

Fourth, I claim preparing and conveying the pomice from the crushing rollers into the hoop, then pressing the same and discharging it through the contractor and gate, by one continuous operation, by the joint action of the rollers, C C, follower, H, cylinder, L, hoop, M, contractor, N, and gate, N′, when arranged and combined substantially as specified.

44,097.—Vapor and Coal Oil Fnrnace.—R. C. Jackson, Detroit, Mich.:

I claim the pipes, F and G, in combination with the deflectors, C, when arranged and operating conjointly in the manner and for the purpose set forth.

44,098.—Seed Drill.—John F. Keller, Greencastle, Pa.:

I claim, first, The combination of the rubber spring, D, with the caps, E and G (or their equivalents), the central rod, L, and the shovel or share, substantially in the manner and for the purposes set forth.

Second, I claim the arrangement and combination of the lever, C, stirrup, H (provided with cap, G), with the rod, L, and cap, E, substantially in the manner and for the purposes set forth.

44,099.—Breech-loading Fire-arm.—Wm. R. Landfear, Hartford, Conn.:

I claim the lever, o n, applied to the breech, and in combination with the opening, d d m, the frame, B, substantially as and for the purposes herein specified.

44,100.—Saw Mill.—Dennis Lane, Montpelier, Vt.:

I claim, first, The dog, N, applied to the segment, L, and bent or curved, as shown, to operate in connection with the ratchet, M, and pin, a, of pawl, I, substantially as described.

Second, The latch, K, applied to the segment, L, in connection with the pin, a, of the pawl, I, arranged substantially as shown to regulate the sweep of lever, H.

[This invention relates to certain improvements in a saw mill carriage, for which Letters Patent were granted to this inventor, bearing date July 9th, 1861, and Jan. 12th, 1864.]

44,101.—Hasp for Trunk Locks.—Conrad Liebrich, Philadelphia, Pa.:

I claim the semi-cylindrical end, a, of the portion, A, of the hasp, with the rivets, h, in combination with the semi-cylindrical end, e, of the portion, B, and the washer, f, the two parts of the hasp being constructed and adapted to each other, substantially as set forth.

44,102.—Horse Hay Fork.—David Lippy and John H. Palm, Mansfield, Ohio:

We claim the two bars, B C, provided with tines, b, and connected by pivots, a, to the standard, A, in connection with the tripping device composed of a lever-catch, D, spring, E, and bar, F, or their equivalent, all arranged to operate as and for the purpose specified

44,103.—Machine for planting Potatoes.—Tobias Marcus, Washington, D. C.:

I claim the arrangement and combination of the seeding and planting devices, I J M N P R S and T, as arranged and combined with an adjustable frame, C and F, with plows and roller attached, as herein described and for the purposes set forth.

44,104.—Hop Frame.—L. S. Mason, Middlefield Center, N. Y.:

I claim, first, The employment or use of training sticks, D (in contradistinction to training wires), in combination with stacks, C, cords or wires, b, hooks, c, and main wire, B, constructed and operating in the manner and for the purpose substantially as herein shown and described.

Second, The hook, c*, having its eye, e, past the center of its light and applied in combination with the training stick, D, and main wire, B, in the manner and for the purpose substantially as set forth.

44,105.—Shaft-hanger.—John S. Mitchell, South Boston, Mass.:

I claim the improved shaft-hanger as composed of the supporting bracket, A, the three wheels or rollers, C C E, and the adjustable boxes, F F, arranged and combined in manner and so as to operate substantially as specified.

44,106.—*Medical Compound.*—C. A. Morse, Williamsport, Ohio:

I claim the "Caucassian lotion" prepared of the within-described ingredients, mixed together in about the proportion and substantially in the manner specified.

[This compound, which is termed "Caucassian lotion," is particularly intended for removing tan, freckles, mildew, etc., from the face and other parts of the body, and we recommend our fair readers to give it a trial, if they should have occasion to use it.]

44,107.—Pneumatic Ways for Transmission of Parcels, etc.—E. P. Needham, New York City:

I claim, first, The employment as a pneumatic way for the transmission of letters, merchandise, passengers, etc., of a continuous viaduct or system of tubes, in which air separated from and out of the influence of the surrounding atmosphere is caused to circulate by means of an air-pump in such a manner as to pass and repass uninterruptedly in a complete circuit, substantially as herein described.

Second, The employment in combination with a pneumatic way of branch viaducts or tubes, I I, for the purpose of conducting the current of air around the stations or points where it is desired to stop the carriages, substantially as and for the purpose herein specified.

Third, The employment in combination with a pneumatic way of a system of receiving and delivery gates and stop gates, so arranged that the stop gates will shut the receiving and delivery gates out of the circuit of the air in the viaduct or tubes, and allow them to be opened without interrupting the circuit, substantially as herein set forth.

Fourth, Providing air-chambers, b b, at the stations and termini of the way, substantially as and for the purpose herein specified.

Fifth, Furnishing the air-chambers, b b, with nuts, d d, substantially as and for the purpose herein specified.

44,108.—Coal Elevator Bucket.—A. B. Nimbs, Buffalo, N. Y.:

I claim, first, A coal elevating bucket having vertical strengthening bars, B, and a horizontal back bar, C, substantially as described.

Second, Prolonging the strengthening bars, B, so that they will project upward above the main body of the bucket, as shown at b′, substantially as set forth.

44,109.—Damper for Stove-pipes.—John the Yahle Florence, Mass.:

I claim the damper, C, in combination with a base or plate, A, of flaring or other form, so as to have an opening for the damper of smaller diameter than the latter, and the base or plate fitted snugly in the stove-pipe with the damper, a short distance above its orifice or opening, substantially as and for the purpose specified.

44,110.—Feed-roller for Saw and Planing Machines.—Andrew Parker, Cleveland, Ohio. Ante-dated Sept. 1, 1864:

I claim the combination of the sectional rubber rollers, F, and washers or disks, E, with the shaft, A, when two or more rubber rollers are used, as herein set forth.

44,111.—Sub-aqueous Structure.—George A. Parker, Lancaster, Mass.:

I claim the building and setting of stone piers for bridges or other structures, by means of a suspended sectional iron cassion, substantially in the manner herein described.

I also claim the use of the cassion, which constitutes the coffer dam, for permanently enclosing and strengthening the pin, substantially as described.

I also claim in combination with an iron cassion in which a pier is built and lowered to its foundation, and which cassion forms a permanent iron casing to the pier, a timber platform, B, united thereto in the manner substantially and for the purpose described.

44,112.—Treating Impure Zinc.—Anthony Pierce, Jr., New Bedford, Mass.:

I claim the process, substantially as above described, for treating refuse or impure zinc, with reference to the separation of the zinc from the iron contained in the metal.

44,113.—Breast Strap Shield for Harness.—Martin W. Pond and Henry E. Mussey, Elyria, Ohio:

We claim the curved metallic shield having curved metallic horns, as described, in combination with the projections or base of horns, forming the clamping seat, f, of the shield, the whole being constructed in the manner and for the purpose described.

44,114.—Cigar Machine.—John Prentice, New York City:

I claim, first, The employment of a group of elastic rollers made concave longitudinally for the purpase of giving proper shape to the cigar, and applying the wrapper thereto, substantially as herein described.

Second, I claim in combination with the elastic rollers the elbow levers, m n, cross bar, s b, rods, u u, and bar, p, as and for the purposes set forth.

Third, I also claim the sliding boxes when used in combination with the arrangement of levers and rollers for the purpose of introducing and discharging the cigar from the machine, when made and constructed as herein described.

44,115.—Skate.—Washburn Race, Lockport, N. Y.:

I claim the dove-tailed groove, a, in the bearing, C, and the notch, c, in combination with the wedge-sided runner, B, screw, D or D′, and foot piece, A, substantially as and for the purpose herein set forth.

44,116.—Horse Hay Fork.—John L. Ripley, Tremont, Ohio:

I claim fork, F, constructed with straight lines, m, a bent arm, r, fitted on a fulcrum belt, q, and a catch or fastening composed of the notched arm, t, and the notched end, s, of the arm, r, bar, w, and spring, b′, all arranged substantially as and for the purpose specified.

[This invention relates to a new and improved horse hay fork, such as are used for elevating hay in barns, taking it from the loaded wagon or cart, and depositing it in the mow.]

44,117.—Composition for Concrete Pavement.—E. Seeley, Scranton, Pa.:

I claim the within-described composition, mixed together of the ingredients specified, about in the proportion and substantially in the manner set forth.

I claim also heating the silica to 230°, more or less, before mixing it with the other ingredients, substantially as and for the purpose described.

[The composition which forms the subject matter of this invention has been tried with great success; it is cheap, durable, and it can be used with advantage for sidewalks, garden walks, cellar floors, and wagon roads, also for roofing buildings, for bridge abutments and arches, and for lining reservoirs or aqueducts.]

44,118.—Magnetic Water Gage.—George W. Smith & Charles F. Henis, Cincinnati, Ohio:

I claim the vertical tube, C, and magnet, D, in combination with the float, A, and revolving index, c, constructed and operating as and for the purpose specified.

44,119.—Ordnance.—Charles W. Stafford, New York City:

I claim the breech-piece, B, constructed and applied as specified to form an accelerating chamber around the main base and grooved or corrugated at its forward end to provide communication between the bore and the surrounding chamber.

[This breech-piece is cast solid and screwed into the rear of the gun, the latter being strengthened by a series of reinforce bands. The gun being thus put together is bored from the muzzle in customary manner.]

44,120.—Cast Steel Car Wheel.—Charles W. Stafford, Saybrooke, Conn.:

I claim, first, The employment in the casting of cast steel car wheels or other cast steel castings of a shell or core made of metal filled with sand, together with the bolt, d, or other similar device, in combination with a metallic flask or mold, as and for the purposes described.

Second, I claim as an article of manufacture a cast-steel car wheel, when the same is made as described.

44,121.—Metallic Bridle Winker.—Miles O. Stanley, South Danvers, Mass.:

I claim, first, Constructing a bridle winker wholly of metal, substantially as and for the purpose described.

Second, Attaching the bridle winker to the head strap by means of rivets, substantially as set forth and for the purpose described.

44,122.—Quartz Crusher.—J. W. Stanton (assignor to himself and M. B. Dodge), Black Hawk Point, Colorado:

I claim adjusting the axis of the movable jaw relatively to the stationary jaw, by means of plates or blocks placed before or behind the journal box.

44,123.—Breech-loading Fire-arm.—Joshua Stevens, Chicopee Falls, Mass.:

I claim the arrangement and combination of the breech-elevating spring and the cartridge shell discharger together, in such manner and with respect to the barrel and stock that while the spring may be performing its function of elevating the barrel, at its breech end it shall retract the cartridge shell discharger, for the purpose as hereinbefore specified.

44,124.—Hoisting Apparatus.—Alonzo L. Sweet, Norwich, Conn.:

I claim the two sliding or shifting pinions, I I′, and the loose sunken gears, a a′, and the pinions, D D′, on the shaft, B, in combination with the wheels, N N′, on the hoisting shaft, L, the pinions, D D′, and wheels, N N′, being of different diameters, and all arranged to operate in the manner substantially as and for the purpose set forth.

I further claim the rack, b, on the slide, L, the pinion, M, and lever, N*, for moving the arm, K, and pinions, I I′, substantially as described.

[This invention relates to a new and improved hoisting device by which heavy and light loads may be elevated with a speed corresponding to their weight, so that advantage may be taken of a light load, and the power expended or applied in rapidly hoisting it, while the speed may be diminished and the power correspondingly increased in hoisting a heavy load, the device at the same time admitting of articles being lowered without the running of the driving rope, thereby effecting a saving in the wear and tear of the rope.]

44,125.—Cabinet for exhibiting Photographic Pictures, etc.—J. A. Thompson, Auburn, N. Y. Ante-dated Sept. 2, 1864:

I claim, first, The construction and arrangement of a photograph cabinet, in which photographs and other pictures may be readily exhibited through a plain glass, and preserved from chemical and mechanical effects of air, light, dust and handling.

Second, An improvement in chain of compartments for receiving and carrying the pictures, by using for back of the compartments a strip of sheet brass or like metal, in combination with a tape or ribbon in the front of the cards, which gives the requisite elasticity to regulate their movement, the whole being constructed and operated as described.

44,126.—Safety Stop for revolving Fire-arms.—Wm. Tileston, Georgetown, D. C.:

I claim the screw lock, C, the stop screw, G, and the countersinks or depressions, D D D, constructed and used substantially as and for the purpose set forth.

44,127.—Breech-loading Fire-arm.—Frederick Townsend, Albany, N. Y., and Nathan S. Clement, Worcester, Mass.:

We claim making the bore in the breech-piece smaller at the rear than along the main part of its length, in combination with making of the breech pin carrier with the front end of larger diameter, than along the main portion of its length, substantially as and for the purpose described.

We also claim the arrangement of the abutting piece fitted to slide in a mortise extending through the thickness of the breech-piece, so that its upper end shall extend to the surface thereof to be visible when the carrier is locked, and with its lower end extending below to depress the lever of the trigger when the carrier is not locked, as described.

And we also claim the arrangement of the finger lever fitted to and having its fulcrum in a slot in the breech-pin carrier, and its rear end resting on the upper end of the abutting piece as herein described, in combination with the carrier and the abutting piece, so that by a single pull backward the abutting piece shall be depressed and held down, and the carrier drawn back, as set forth.

44,128.—Machine for breaking and cleaning Flax.—G. B. Turner, Cuyahoga Falls, Ohio:

I claim in combination with the sets, pairs, or series of feeders and beaters, the inclined screen or fingers for raising up the tow or fiber and screening the shives therefrom, and the canopy, to gather, guide, and direct the tow from the first to the second series of feeders and beaters and screeners, substantially as and for the purpose herein described and represented.

44,129.—Hay Elevator.—Edward L. Walker, Benford Store, Pa.:

I claim the tubular rod, A, provided with an internal sliding rod, F, in combination with the barbs, E E, projecting from circular plates, D D, placed loosely on a shaft in the pointed head, C, and provided with recesses, c, all arranged substantially as and for the purpose specified.

[This invention relates to a new and simple device for elevating hay in barns and discharging it in mows, and is designed to supersede the ordinary horse hay forks now used for that purpose.]

44,130.—Metallic Concentrator.—Zenas Wheeler, San Francisco, Cal.:

I claim, first, The arrangement and combination of the corrugated surface, B, with the inclined grooves, K L K′ L′, or their equivalent, substantially as and for the purposes set forth.

Second, The opening, D, adjustable gate, E, and the bowl and tube, F, or either of them in combination with a vibratory or oscillating pan or concentrator, substantially as and for the purposes herein specified.

44,131.—Tree Protector.—Cyrus H. Whitlock, Whiting, Vt.:

I claim the cylindrical form and flange of my protector.

44,132.—Gate.—Samuel Whitman, Wayland, N. Y.:

I claim a road or farm gate, composed of three sections united to each other, and to the gate posts, so as to be opened individually or collectively, in the manner and for the purpose herein described and represented.

44,133.—Brick Press.—Abraham Witmer, Henry, Ill.:

I claim, first, The slotted inclined arms, C, attached to the shaft, B, for the purpose of forcing the clay through the grating, D, and without drawing the clay around in the mud mill, A, substantially as set forth.

Second, The frame, F, provided with the rollers, G H, placed within the box, E, and hung upon a rod, I, at one end and supported by wedges, J J, at the opposite end, substantially as and for the purpose specified.

Third, The bars, N N, attached to arms, M M, on a shaft, K, provided with a spring, L, all arranged and applied, substantially as shown for the purpose of forcing the empty molds in proper position underneath the mud mills to receive the clay, and in forcing the filled molds out from underneath the mud mill, as set forth.

44,134.—Brakesman's Life-preserver for Railroad Cars—John Worsley, Providence, R. I.:

I claim the combination of the before-described Brakesman's life-protector with the car body of a railroad car, substantially as set forth.

I also claim the end standard constructed with a fork to hold the hand ring of the traversing chain in a position where it may be found with facility, substantially as set forth.

I also claim the combination of the Brakesman's life-protector with intermediate sustaining standards projecting above the roof of the car body between the ends of the rod, substantially as set forth.

44,135.—Sorghum Evaporator.—Levi Wight, Wapella, Ill.:

I claim a self-skimming evaporator, constructed and operating substantially in the manner herein shown and described.

I also claim the combination of a skimmer, D, with a juice receptacle or compartment, F, substantially in the manner herein shown and described.

I also claim the inclined arrangement of the skimmers so that their refuse drippings will be conducted away from the evaporator.

I also claim the combination of the guttors, E, with the skimmers, D, as and for the purpose herein shown and described.

44,136.—Hominy Mill.—Warren Wright, Springfield, Ohio:

I claim, first, The agitators, T t, revolving within the apertures, h, of the floors, H, and in the plane of said floors, substantially as herein described.

Second, The combination of the centrally perforated floors, H h, perforated hollow suction shaft, J J′, beaters, L, agitators, T t, fan, K, and spout, S, all arranged and operating as specified.

44,137.—Distilling Hydro-carbon Oil.—Wm. Archer (assignor to himself and Wm. P. Downer), New York City:

I claim the manner herein described of continuously and fractionally distilling and separating the various parts of hydro-carbon oils, by the application of super-heated steam or heated air, substantially in the manner described.

I also claim the combination of the heating tube, b, with the deflecting and receiving disks, c and e, with the spiral or straight feeding tube, d, in the manner and for the purposes as described.

44,138.—Machine for dressing Flax and Hemp.—C. G. Howard (assignor to himself and E. A. Goodell), Topeka, Kansas:

I claim the fluted breaking rollers, I I′, in combination with the rotating dresser, G G′, provided with teeth, c, and the clamp, T, arranged to operate as and for the purpose set forth.

I further claim the dogs, V V′, and yielding board, U, in connection with the rack bars, R R, all arranged to operate with the clamp, T, as and for the purpose specified.

[This invention consists in the employment or use of two fluted breaking rollers, two rotary dresses and a rising and falling clamp to hold the hemp or flax while being operated upon.]

44,139.—Binding Attachment to Harvesters.—Jacob Behel & Wheeler Hedges (assignors to said Jacob Behel), Earlville, Ill.:

We claim the combination of the jointed-arm with instrumentalities for alternately extending its members in line with each other or thereabouts (so as to reach the loose grain) and for drawing them in, to embrace the grain as it is compressed, the whole operating substantially as set forth.

We also claim the combination of one member of said jointed arm with an adjustable fulcrum, substantially as set forth.

We also claim the combination of the arm for carrying the compressing belt or the binding material, or both of these, with a slotted frame to guide the extremity of the arm while it is moving, substantially as set forth.

We also claim the combination of a flexible compressing belt with a slotted frame so that it is guided while being moved, substantially as set forth.

We also claim the compressing belt tension herein described, consisting substantially of two sets of pulleys pressed apart by a spring or its equivalent, the whole operating substantially as set forth.

We also claim the combination of the reel of the binding material and the arm that applies said material to the grain, with an adjustable guide located between the two, and operating substantially as set forth.

We also claim the combination of one end of the compressing belt with a movable belt holder, by which that end of the belt is moved out of the track of the grain, the combination operating substantially as herein set forth.

We also claim the combination of the holder which holds the end of the binding material, with a movable support by the movement of which the outermost portion of the binding material is moved out of the way of the grain, substantially as set forth.

We also claim the combination of the compressing and band-applying and securing devices with the same reciprocating instrument in such manner that all are operated in their proper order by the

© 1864 SCIENTIFIC AMERICAN, INC.

reciprocation of that one instrument, substantially as herein set forth.

We also claim the combination of the reciprocating piston, slide-box, detent, and controlling plate, the whole operating substantially as herein set forth.

We also claim the combination of the reciprocating piston and slide box, with two detents, and an adjustable controlling plate, the whole operating substantially as set forth.

We also claim the combination of the binding mechanism with a reciprocating and turning discharging hand which withdraws the bound sheaf from the place where it is bound and is then withdrawn from the sheaf, substantially as set forth.

44,140.—Amalgamator.—A. W. Hall (assignor to himself, R. K. Belden & Samuel Jardon), New York City:

I claim the employment or use in a gold or silver amalgamating device of a series of amalgamated plates, placed or secured at proper distances apart so as to allow the pulp to pass freely between them, and attached either to a crushing wheel or drag, so that they may during the amalgamating process be drawn through the pulp, and catch or arrest and amalgamate the fine particles of gold or silver contained therein, substantially as herein set forth.

44,141.—Removable Runner for Carriage Wheels.—Geo. A. Keene, (assignor to himself and Henry W. Moulton) Newburyport, Mass.:

I claim first, Confining the runner, B, to the wheel by means of the block, C, straps, g g, and bolt h, substantially as described.

Second, The employment of the elastic pad or cushion, I, in combination with the wheel, block and runner substantially as and for the purpose described.

44,142.—Apparatus for crutching Soap.—J. M. Leslie, Newburgh, N. Y., assignor to himself and Jesse Oakley, New York City:

I claim the employment of rising and falling oscillating crutches, E, operated by steam or other competent power in the interior of the crutching kettle, A, substantially in the manner and for the purpose shown and described.

44,143.—Manufacture of Fulminating Powder.—Jean Stephan Lippo, (assignor to Richard Reichel) Brooklyn, N. Y. Ante-dated September 2, 1864.

I claim the employment or use of a box, A, or its equivalent, filled with straw, or other similar material and provided with a perforated top, B, or its equivalent in combination with a retort or vessel containing the ingredients necessary in the manufacturing powder substantially as and for the purpose shown and described.

44,144.—Packing for Hyro-carbon Burner.—Josiah Waterman, New York City.:

I claim the combination with the pipes and closed chamber, B, of a hydro-carbon burner, of a packing of coarse emery or its equivalent, substantially in the manner and for the purpose set forth.

44,145.—Apparatus for roasting and reducing Ores.—George W. White, New York City, assignor to himself and Austin G. Day, Seymour, Conn.:

I claim first, The use of an inclined rotating cylinder in combination with a furnace, at the receiving end of said cylinder, and a bonnet at the discharging end thereof, to conduct or direct the calcined ore into a trunk or other receptacle.

Second, I claim grooving the inner surface of the cylinder longitudinally, for the purpose and substantially as specified.

Third, The employment in combination with the furnace and rotary cylinder, of a vibrating shoe or feeder, for the purpose described.

Fourth, Operating each feeder by means of the revolving cylinder through the agency of projections thereon, as specified, or any equivalent therefor, substantially as described.

44,146.—Boots and Shoes.—Thomas Grason, Manchester, Great Britain:

I claim securing sole and heel pieces to the soles and upper leather of boots and shoes, and other coverings for the feet by the use of dovetailed or T shaped projections and grooves substantially as and for the purpose specified.

44,147. — Manufacture of Manure. — Alfred Francois Mosselman, Paris, France.

I claim first, The manufacture of animalized lime or "manure balls," by a process substantially as herein set forth.

Second, The use of urine for the purpose of slacking lime either under pressure or in an ordinary atmosphere, substantially as and for the purpose described.

RE-ISSUE.

Riding Stirrups and their Covers.—Robert N. Eagle, Washington, D. C. Patented September 17, 1861.

I claim first, The locating of the point of suspension inside or outside of a vertical line which is drawn from near the center of, and at right angles to the tread of the stirrup, substantially as set forth.

Second, in making this inclination adjustable by the sliding hub or its equivalent so as to suit the different circumstances under which it may be used, or the conformation of the user, substantially as described.

Third, The peculiar angular construction of the eye and the manner of its attachment to the body of the stirrup, so as to impart to the tread of said stirrup an angular position horizontally, and also with reference to the body of the horse, thus allowing an easy entrance to the foot without twisting the stirrup leather and causing at the same time the foot to move in the proper directions, substantially as set forth.

Fourth, Hanging the stirrup upon the horizontal or nearly horizontal axis which passes angularly over the tread in the direction of a line drawn horizontally from the little toe to the instep, substantially as set forth.

Fifth, Constructing the sides or arms of a stirrup in a spiral form with the inner side or arm shorter than the outer side or arm so as to compel the toes and foot of the rider to turn inward toward the body of the horse, substantially as described.

Sixth, Constructing the tread or marginal base of the stirrup with an irregular concavity in order to conform to the bend of the foot or boot, and with the front of said marginal base of the tread higher relatively than the base at the entrance of the stirrup, as and for the purposes described.

Seventh, The cover of the stirrup, said cover being made of one piece, the lower portion being turned inward from the bottom to cover the tread and lower part of sides thus forming a guard and protection to the foot, substantially as set forth.

Eighth, A guard or bar, g, to be applied to the stirrup or stirrup frame, to prevent the foot from passing too far through, or to serve as a support for the cover where one is used.

To Advertisers.

Owing to the length of the official report of Claims furnished for this number the advertisements which usually occupy this page are necessarily omitted.

RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that ten words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

AN INTEREST IN A VALUABLE INVENTION FOR sale.—Major SMITH'S Improved Cannon-sight. A line shot can be had on first trial. Model to be seen in this office. Patented in 1863. 10 tf

PATENTED WOOD BENDERS. — THOROUGHLY tested, and unequalled for bending all kinds of Timbers for Carriages, Furniture, Vessels, and Agricultural Implements. JOHN C. MORRIS, No. 122 East 2d street, Cincinnati, Ohio. 10 10*

WE WISH TO EMPLOY A MAN THOROUGHLY acquainted with the manufacture of Malleable Iron, to take charge of a Furnace. References required. MILLER & MOORE, Louisville, Ky. 10 3*

PROPOSALS FOR HARNESS IRONS.

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, Sept 1, 1864.

Proposals will be received by this Department until Saturday, the 17th day of September, at 4 o'clock P. M., for the delivery at the Springfield Armory, Mass., Watervliet, Frankfort, or New York Arsenals, of 6,000 single sets of Wrought Iron Work, for United States Artillery Harness.

The Harness Irons are to be packed in well made boxes, containing twelve single sets each, being an assortment for four wheel and eight lead horses; and each twelve sets, so packed, will consist of the following pieces:—

3 pairs long Hames, complete.
3 pairs short Hames, complete.
6 pairs medium Hames, complete.
48 Trace Clips, with 144 rivets.
4 Double Loops or Eyes.
12 Saddle Loops (bent for cantle).
24 Trace Eyes.
24 long Chains, with toggles.
4 Breast Hooks.
2 Leg Guards, with ten rivets.
6 Saddle Loops, straight, for riding-saddle pommels.

These Harness Irons are to conform strictly in pattern and weight to the model sets to be seen at this office and at the Springfield Armory; are to be smoothly finished; are to fill the standard gages, and each piece is to be made of the size and kind of iron prescribed in the official bill of iron, copies of which can be obtained at this office, at the New York Agency, and at the Springfield Armory.

All the Irons are to be well japanned—the japan to be of the best quality, and well baked on. They are to be subject to inspection at the factory where made, before and after japanning.

The Hames are to be marked with the maker's name, the size, and the letters U.S.A. The latter letters one-fourth of an inch high.

All the pieces are to be put up in proper bundles, properly labelled, and each box is to be carefully packed, as prescribed by the Inspector. The packing-box to be paid for at the Inspector's valuation.

Deliveries are to be made at the rate of not less than sixty sets per day, commencing on the 1st day of October, 1864, next.

Failure to deliver at the specified time will subject the contractor to a forfeiture of the number he may fail to deliver at that time.

No bids will be considered except from parties actually engaged in the manufacture of this or similar kinds of iron work, and who can bring ample evidence that they have in their own shops all the machinery and appliances for turning out the full amount of work specified per day.

GUARANTY.

The bidder will be required to accompany his proposition with a guaranty, signed by two responsible persons, that, in case his bid be accepted, he will at once execute the contract for the same, with good and sufficient sureties, in a sum equal to the amount of the contract, to deliver the articles proposed, in conformity with the terms of this advertisement; and in case the said bidder should fail to enter into the contract, they to make good the difference between the offer of said bidder and the next responsible bidder, or the person to whom the contract may be awarded

The responsibility of the guarantors must be shown by the official certificate of the Clerk of the nearest District Court, or of the United States District Attorney.

Bonds in a sum equal to the amount of the contract, signed by the contractor and both of his guarantors, will be required of the successful bidder or bidders upon signing the contract.

FORM OF GUARANTY.

We, the undersigned, residents of ———, in the county of ———, and State of ———, hereby jointly and severally covenant with the United States, and guarantee, in case the foregoing bid of ——— be accepted, that he or they will at once execute the contract for the same, with good and sufficient sureties, in a sum equal to the amount of the contract, to furnish the articles proposed in conformity with the terms of this advertisement, dated Sept. 1, 1864, under which the bid was made; and, in case the said — shall fail to enter into a contract, as aforesaid, we guarantee to make good the difference between the offer of the said ——— and the next lowest responsible bidder, or the person to whom the contract may be awarded.

Witness: { Given under our hands and seals this — day of —, 186—.
[Seal.]
[Seal.]

To this guaranty must be appended the official certificate above mentioned.

Forms of bid can be obtained at any of the above named arsenals. Proposals not made out on this form will not be received.

Bids will be received for the entire number or any part thereof; and bidders will state the arsenal at which they can deliver, and the number of sets at each, if for more than one.

The Department reserves the right to reject any or all bids if not deemed satisfactory.

Proposals will be addressed to "Brigadier General George D. Ramsay, Chief of Ordnance, Washington, D. C.," and will be endorsed "Proposals for Harness Irons."

GEO. D. RAMSAY, Brigadier General,
12 2 Chief of Ordnance.

QUARTERMASTER'S OFFICE, Philadelphia, Sept. 6, 1864.

SEALED PROPOSALS WILL BE RECEIVED AT this office until 12 M., on Monday, the 26th instant, for furnishing Anthracite Steamer Coal for the War Department, for a period of six months, commencing Oct. 1st, 1864, and ending March 31st, 1865. Coal to be of the best quality Anthracite for the use of steamers, to weigh 2,240 lbs. to the tun, and to be subject to inspection.

The coal is to be delivered on board vessels in the ports of Philadelphia or New York, in such quantities, and at such times as may be required, furnishing, if demanded, seven thousand tuns per week.

In case of failure to deliver the coal in proper quantity, and at the proper time and place, the Government reserves the right to make good any deficiency by purchase at the contractor's risk and expense. The price must be given separately for the coal delivered on board of vessels at this port and New York, on the terms and conditions above stated. Twenty per cent will be withheld from the amount of all payments made, which reservation is not to be paid until the contract shall have been fully completed. Payments of the remaining eighty per cent, or balance due, will be made monthly, when the Department is in funds for that purpose.

Each offer must be accompanied by a written guarantee, signed by two or more responsible parties (their responsibility to be certified by a United States District Judge, Attorney, or Collector), that the bidder or bidders will, if his or their bid be accepted, enter into written obligation, with good and sufficient sureties, in the sum of one hundred thousand dollars, to furnish the proposed supplies. No proposition will be considered unless the terms of this advertisement are complied with.

The right is reserved to reject all the bids if considered to be to the interest of the service to do so, and no bid from a defaulting contractor will be received.

Proposals to be endorsed "Proposals for Coal for the War Department," and addressed to the undersigned.

By order Col. A. J. PERRY, Q. M. Dept. U.S.A.
12 3 GEO. R. ORME, Capt. and A.Q.M.

AGENTS WANTED TO SELL THE CELEBRATED Franklin Sewing Machine, on a salary or liberal commission. For valuable particulars, address Box 302, Boston, Mass. 9 10*

CAVALRY HORSES WANTED.

CAVALRY BUREAU, OFFICE OF ASSIST. QUARTERMASTER,
No. 18 State street, New York, June 10, 1864.

I WILL PURCHASE IN OPEN MARKET ALL THE Calvary Horses that may be presented and pass inspection at the Government Stables, corner of 10th avenue and 35th street, in this city, until further notice.

Payment will be made in checks payable in certificates of indebtedness, when seven (7) or more horses are received. Price, one hundred and sixty dollars each.

6 tf GEO. A. BROWNING, Capt. and Assist. Qr. Mr.

THE RIGHT TO MANUFACTURE THE ST. CLAIR Harvester and my Patent Grain Drill, can be had on easy terms. W. P. PENN, Belleville, Ill. 7 6*

DEPOT FOR NEW INVENTIONS IN CABINET Making.—Agencies taken for inventions adapted to Cabinet Making, by SMITH & BUTLER, No. 449 Broome street, New York, Manufacturers of Furniture Bronzes, French Moldings, Nameplates, &c. 10 3*

J. A. FAY & CO., CINCINNATI, OHIO,
MANUFACTURERS OF
PATENT WOOD-WORKING MACHINERY,
PARTICULARLY DESIGNED FOR
RAILROAD AND CAR SHOPS.
ALSO, FOR
PLANING MILLS,
Hand Blind, Cabinet, Box Wheel, Felloe and Spoke, Stave and Barrel Manufactories, Agricultural Implement Makers, &c.
Warranted superior to any in use. Illustrated Catalogues furnished on application. 8 12*

PORTABLE STEAM ENGINES—COMBINING THE maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 300 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address J. C. HOADLEY & CO Lawrence, Mass. 9 tf

FOR GRAY & WOOD'S, WOODWORTH & DANIEL'S Planers, address J. A. FAY & CO., or E. C. TAINTER, Succeeding Partner, Worcester, Mass. 9 a*

WHAT THE COUNTRY WANTS, AND HOW TO make Money.—To you that know of the fortunes made by manufacturers of some of the recent inventions—the Sewing Machine, or the Reaper and Mower, for instance—and would like to emulate them, we offer to sell (subject to a moderate license fee) the exclusive right to manufacture and sell in the Northern States, Comstock's Rotary Spader, a substitute for the Plow, on terms that with capital and enterprise will insure a success heretofore unknown in the history of inventions.

Its practical value has been fully proven by sale and successful use in the field the past two seasons, creating a demand we are unprepared to supply. Its utility is greater, and the field open to its use is larger, than that of the Reaper and Mower, the manufacture of which for the harvest of 1860, is estimated by the Commissioner of Patents to number ninety thousand machines.

We will sell as above proposed, or sell less territory—not less than a State. Will go into a firm or joint stock company, at a suitable point, or consider propositions of any nature looking to a speedy establishment of the manufacture on a suitable scale. Address COMSTOCK & GLIDDEN, Milwaukee, Wis. 11 4*

FOR BURLEIGH'S FRICTION CLUTCH PULLIES, address E. C. TAINTER, Worcester, Mass. 11 c*

FOR SALE.—THREE MILLING MACHINES, OF the best style, and but little used. Also a complete set of tools, gages, &c., for making bands for the Springfield musket. S. STOW, Manufacturing Company, Plantsville, Conn. 11 4

TO INVENTORS AND MAKERS OF KNITTING Machines.—Wanted, the best machine for knitting stockings, that will finish its work—plain or ribbed—from top to end of toe, widening or narrowing, as may be required, by pattern or otherwise, by its own mechanism. Address, giving illustrated description and price, Post-office Box 284, New Bedford, Mass. 11 3*

THEYSON & OGG, 39 GREENE STREET, NEAR Grand street, Machinists, Brass Finishers, and Model Makers Experimental Machinery, Indicators, Registers, and Steam Gages of any kind accurately and promptly made. 11 11*

MILL STONE DRESSING DIAMONDS SET IN Patent Protector and Guide. For sale by JOHN DICKINSON, Patentee and Sole Manufacturer and Importer of Diamonds for all Mechanical purposes. Also, Manufacturer of Glazier's Diamonds, No. 64 Nassau street, New York City. Old Diamonds reset.

N. B.—Send Postage stamp for Descriptive Circular of the Diamond Dresser. 11 10*

ALCOTT'S CONCENTRIC LATHES.—FOR BROOM, Hoe, and Rake Handles, Chair Rounds, &c.—Price $25; and all other kinds of Wood-working Machinery, for sale by S. C. HILLS, No 12 Platt street, New York. b

RENSSELAER POLYTECHNIC INSTITUTE, TROY, N. Y The Forty-first Annual Session of this well-known School of Engineering and Natural Science, will commence Sept. 14th, 1864. The Principal Building is completed and ready for occupation. The New Annual Register, giving full information, may be obtained at Appleton's Bookstore, New York, or from Prof. CHARLES DROWNE, Director, Troy, N. Y. 6 8*

GROVER & BAKER'S HIGHEST PREMIUM ELASTIC Stitch Sewing Machines, 495 Broadway, New York. 1 tf

THE SEVENTEENTH ANNUAL EXHIBITION OF the Maryland Institute of Baltimore, for the promotion of the Mechanic's Arts, will commence Monday evening, Oct. 3d, and continue to Monday evening, Oct. 31st, 1864. The Hall will be open for the reception of goods on Monday, Sept. 26th. Goods for competition and premium must be deposited before Thursday night, Sept. 29th. Circulars, embracing details, may be had of the Actuary at the Institute. Communications addressed to the undersigned, or to WM. C. CORNTHWAITE, Actuary, will be promptly attended to.
3 11* W. W. MAUGHLAN, Chairman Committee on Exhibition.

BRASS PINION WIRE FOR GAS AND WATER Meter-makers made by PETER COLLIE, Clock Maker, No. 1,176 South 11th street, Philadelphia, Pa. Also Indicators for counting the revolutions of Machinery. Electric Telegraph Instruments or any kind of fine brass wheel works made to pattern. 7 7*

ENGINEERING, CIVIL AND MILITARY; CHEMISTRY, Metallurgy, Assaying, &c., at Union College, Schenectady, N. Y. For Circular address Registrar. 24 1y*

SAVING OF FUEL TO PARTIES USING STEAM.—DAMPER REGULATORS.

Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms of flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 5 Park Place, New York 3 26*

PLATINA FOR ALL PURPOSES.—ADDRESS H. M. RAYNOR, 748 Broadway, New York. 8 4*

ENGINEERS AND MACHINISTS WANTED FOR the United States Navy. Positions guaranteed before the 1st of September. Address, with two stamps, J. HARRIS, 355 North 10th street, Philadelphia. 6 6*

FOR SALE.—ONE PULLEY, 80 INCHES DIAMETER, 24-inch face, bored for 3⅞-inch shaft. Apply to "Providence Tool Company," Providence, R. I. 4 tf

NERVOUS DISEASES AND PHYSICAL DEBILITY, arising from Specific causes in both sexes—new and reliable treatment, in Reports of the Howard Association—sent in sealed letter envelopes, free of charge. Address Dr. J. SKILLIN HOUGHTON Howard Association, No. 2 South Ninth street, Philadelphia, Pa. 1 12*

IRON PLANERS, ENGINE LATHES, DRILLS AND other machinists' tools, of superior quality, on hand and finishing, for sale low. For description and price address NEW HAVEN MANUFACTURING COMPANY, New Haven, Conn. 1tf

HOLSKE & KNEELAND, MODEL MAKERS. PATENT Office Models, Working Models, and Experimental Machinery, made to order at 100 Walker street, between Center and Elm, New York. Refer to Munn & Co., SCIENTIFIC AMERICAN Office. 1tf

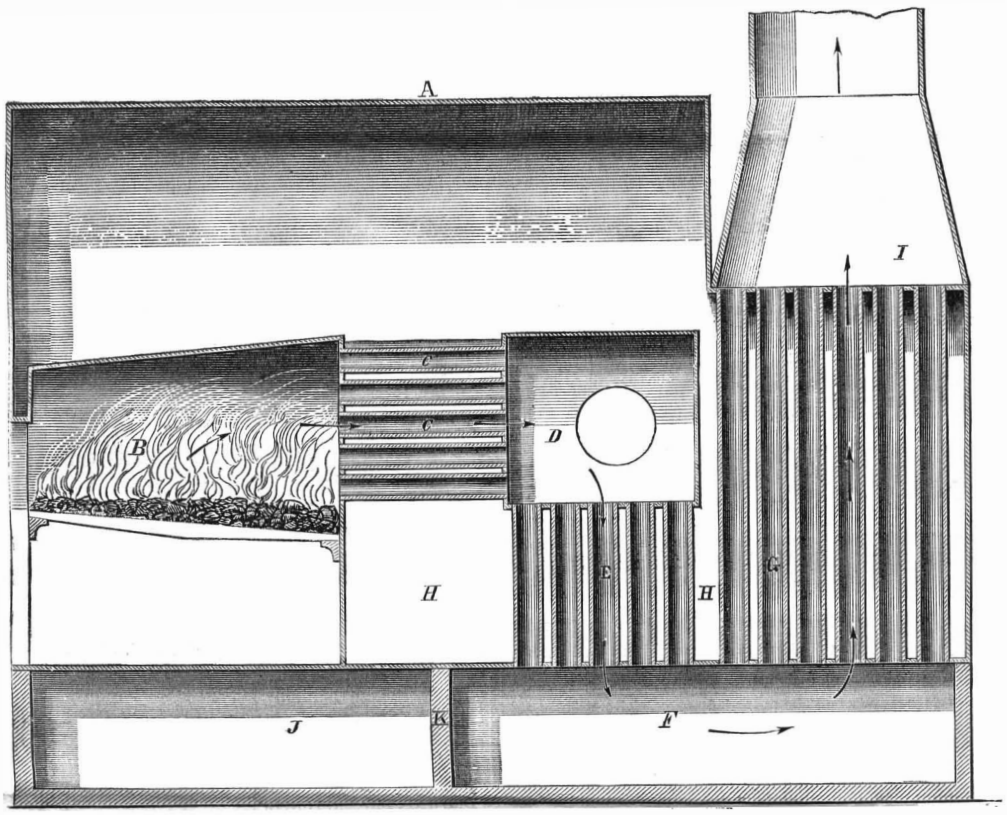
MANUFACTURERS OF STEAM ENGINES, WITH the link motion, variable cut off of the most approved construction; also Lathes, Mill-gearing, Shafting Hangers and Machinery in general. Address M. & T. SAULT, New Haven, Conn. 19 26*

© 1864 SCIENTIFIC AMERICAN, INC.

Improved Steam Boiler.

The proper distribution of the heating surface in a steam boiler is very important, since the quantity of fuel required to evaporate a given amount of water in a given time is directly affected by it. In the boiler herewith illustrated both the horizontal and vertical systems of setting the tubes is adopted, and the heat, instead of passing off at a high temperature, is taken up in its course and imported to the water to be evaporated. From the freedom of the water spaces a good circulation is constantly maintained, and the steam room is open and ample, instead of being contracted.

The boiler shell, A, has the furnace, B, set in it, at



LESLIE'S STEAM BOILER.

the back end of which the horizontal flues, C, are inserted, and run into a combustion chamber, D. In this the gases which were unconsumed in the furnace are driven over by the draft, as shown by arrows, and are ignited and consumed, instead of being carried directly through into the smokepipe, as in the locomotive boiler. From the combustion chamber the heat descends into the second system of flues, E. After passing through these they emerge into the smoke-box, F, and finally deliver whatever heating value remains in them to the third system of flues, G. The water space around the flues, C and E, is shown at H. The smokepipe is attached to the hood, I, as usual. The ash-pan, J, is separated from the smoke-box, F, by a partition, K. This boiler can be stayed as strongly as any other, and free access can be had to all parts. Should tubes leak, or require to be cleaned, the combustible chamber is amply large for a man to enter and repair or sweep both the horizontal and vertical tubes leading into the same, while the tubes, G, can be cleaned from above, as usual. So long as the crown-sheet is covered in this boiler the flues are also, and the danger of overheating them is much lessened, for it is seldom that an engineer becomes so careless as to let the water get lower than the furnaces.

This boiler was patented through the Scientific American Patent Agency, on July 5th, 1864, by Hugh Leslie, of Jersey City, N. J. For further information address him at Zenas Secor's Fulton Foundry, Jersey City, N. J.

Zinc for Coinage.

We recently published from the London *Mechanics' Magazine* an article on the relation of aluminum; it appeared in that paper as an editorial, over the signature "W. W.," the writer being manifestly an intelligent chemist. In a more recent number of the *Magazine* we find the following remarks by the same writer on the use of zinc as an alloy in silver coins:—

"If our chemists should ever cease to be fascinated, as they seem to have been of late years, by the organic, to the exclusion of the inorganic, branch of the science, it is to be hoped that they will then fully investigate the subject of metallic alloys. We just know generally that the properties of most metals are greatly modified by admixture with other metals, and that a very slight per centage of admixture will often produce most important results; the electric conductivity of copper containing two per cent of arsenic, for example, being less than one-sixth of that of pure copper; but our knowledge of the properties of definite admixtures, even of the metals with which we are most familiar, is exceedingly limited. In this direction a very wide field lies awaiting the explorer, and one in which results of great industrial importance have doubtless yet to be reaped.

"M. Peligot, the chemist to the French mint, has lately made some slight excursions into this field. On account of the continued rise in the value of silver, causing the progressive disappearance from circulation of the old silver money, the French Government is about to lower the standard of its silver coinage by the addition of about seven per cent more copper. The coinage which it is about to issue will contain about 165 parts of copper to 835 parts of silver, unless, indeed, M. Peligot's recent experiments should lead to the use of zinc, instead of copper, wherewith to alloy the more precious metal. His experiments undoubtedly show that alloys of silver and zinc possess considerable physical advantages over the corresponding alloys of silver and copper, while they are of course sensibly cheaper, since the market price of copper is more than four times that of zinc.

"An alloy of silver and zinc in the proportions of the (new) standard alloy of silver and copper above specified, M. Peligot found to be appreciably whiter than the copper alloy, while it is also 'remarkably malleable' and 'perfectly homogeneous when rolled.' He experimented also on alloys of silver and zinc in atomic proportions, and found that both an alloy of one equivalent (or 108 parts by weight) of silver with one equivalent (or 32 parts by weight) of zinc, and an alloy of two equivalents (or 216 parts) of silver with one equivalent (32 parts) of zinc, are readily malleable, while alloys containing either two equivalents of zinc to one of silver, or three equivalents of zinc to two of silver are too brittle to be rolled. All the alloys of silver and zinc upon which he experimented are more fusible, more sonorous, and more elastic than alloys, in the same proportions, of silver and copper; and when those of them which are malleable have had their malleability impaired by hammering, it can be readily restored by simple heating Moreover, the zinc alloys have over the copper alloy the very great advantage of no verdigris being formed by the contact with them of acid liquors, and the equally great advantage of not being nearly so readily discolored by sulphuretted hydrogen, or other sulphur-compounds. M. Peligot, indeed, states that an alloy of 800 parts silver with 200 parts zinc wil preserve its whiteness unimpaired in a solution of a polysulphide in which the standard alloy of silver and copper would soon become quite black.

"Zinc would thus certainly seem to be better adapted than copper to alloy silver with, for coinage; while some of the alloys of silver and zinc abovementioned—especially that of 800 parts silver with 200 parts zinc—should be worth the attention of silversmiths, and other producers of ornamental metalwork."

PICKLES.—These vicious edibles are raised in astonishing quantities. One farmer in Lincoln, Mass., from two and a half acres of vines has gathered at two pickings, 67,000 pickles. They pick about three times a week, in warm, fair weather. Another man gathered from his five acres, at one picking, 80,000. This was regarded as an ordinary yield. Still another man has realized from his ten acres planted with cucumbers, in one season, $1,200. They are selling them now for $1 80 per thousand.

THE

Scientific American,

FOR 1864!

VOLUME ELEVEN,

NEW SERIES.

The publishers of the SCIENTIFIC AMERICAN respectfully give notice that the Eleventh Volume (New Series) commenced on July 2d, 1864. This journal was established in 1845, and is undoubtedly the most widely circulated and influential publication of the kind in the world. In commencing the new volume the publishers desire to call special attention to its claims as

A JOURNAL OF POPULAR SCIENCE.

In this respect it stands unrivaled. It not only finds its way to almost every workshop in the country, as the earnest friend of the mechanic and artisan, but it is found in the counting room of the manufacturer and the merchant; also in the library and the household. The publishers feel warranted in saying that no other journal now published contains an equal amount of useful information; while it is their aim to present all subjects in the most popular and attractive manner.

The SCIENTIFIC AMERICAN is published once a week, in convenient form for binding, and each number contains sixteen pages of useful reading matter, illustrated with

NUMEROUS SPLENDID ENGRAVINGS

of all the latest and best inventions of the day. This feature of the journal is worthy of special note. Every number contains from five to ten original engravings of mechanical inventions relating to every department of the arts. These engravings are executed by artists specially employed on the paper, and are universally acknowledged to be superior to anything of the kind produced in this country.

The publishers of the SCIENTIFIC AMERICAN promise to present, as during preceding years, all the latest improvements in Steam Engineering, War Vessels, Ordnance—military and naval—Fire-arms, Mechanics' Tools, Manufacturing Machinery, Farm Implements, Wood-working Machinery, Water-wheels, Pumps and other Hydraulic Apparatus, Household Utensils, Electric, Chemical and Mathematical Instruments, Flying Machines and other Curious Inventions—besides all the varied articles designed to lighten the labor of mankind, not only in the shop and warehouse, but in every place where the industries of life are pursued.

From its commencement the SCIENTIFIC AMERICAN has been the earnest advocate of the rights of American Inventors and the

REPERTORY OF AMERICAN PATENTS.

In this important department, so vitally connected with all the great interests of the country, no other journal can lay any claim whatever, as in its columns there is published a weekly Official List of the "Claims" of all patents granted at the U. S. Patent Office.

THE PRACTICAL RECIPES

alone are oft-times worth more to the subscriber than the amount of a whole year's subscription.

TERMS OF SUBSCRIPTION.

Two volumes of the SCIENTIFIC AMERICAN are published each year, at $1 50 each, or $3 per annum, with correspondingly low terms to Clubs; $1 will pay for four months' subscription. The numbers for one year, when bound in a volume, constitute a work of 832 pages of useful information, which every one ought to possess. A new volume commenced on the second day of July, 1864.

Specimen copies will be sent gratis to any part of the country

Canadian subscribers will please to remit 25 cents extra on each year's subscription to pre-pay postage.

Munn & Co., Publishers,

37 Park Row, New York.

FROM THE STEAM PRESS OF JOHN A. GRAY & GREEN.

© 1864 SCIENTIFIC AMERICAN, INC.